



National Energy Board

Reasons for Decision

Westcoast Energy Inc.

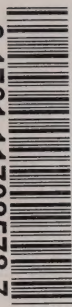
GH-5-94



February 1996

Facilities

CAI
MT76
-A66



3 1761 11708578 7

National Energy Board

Reasons for Decision

In the Matter of

Westcoast Energy Inc.

Application dated 6 October 1994, as
amended, for Fort St. John Expansion Project

GH-5-94

February 1996

© Her Majesty the Queen in Right of Canada 1996 as
represented by the National Energy Board

Cat. No. NE22-1/1995-6-1E
ISBN 0-662-23480-4

This report is published separately in both official
languages.

Copies are available on request from:

Regulatory Support Office
National Energy Board
311 Sixth Avenue S.W.
Calgary, Alberta
T2P 3H2
(403) 292-4800

For pick-up at the NEB office:

Library
Ground Floor

Printed in Canada

© Sa Majesté la Reine du Chef du Canada 1996
représenté par l'Office national de l'énergie

N° de cat. NE22-1/1995-6-1F
ISBN 0-662-80318-3

Ce rapport est publié séparément dans les deux
langues officielles.

Exemplaires disponibles sur demande auprès du :

Bureau du soutien à la réglementation
Office national de l'énergie
311, sixième avenue s.-o.
Calgary (Alberta)
T2P 3H2
(403) 292-4800

En personne, au bureau de l'Office :

Bibliothèque
Rez-de-chaussée

Imprimé au Canada

Table of Contents

List of Tables	iii
List of Figures	iii
List of Appendices	iv
Abbreviations	v
Recital and Appearances	vii
1. Introduction	1
1.1 The Fort St. John Expansion Application, GH-5-94	1
1.2 The Grizzly Valley Expansion Application, GH-6-94	4
1.3 Application for Early Site Preparation Work	5
1.4 Environmental Reviews	5
2. Gas Supply	7
2.1 Established Reserves	7
2.2 Undiscovered Potential	7
2.3 Productive Capacity	8
3. Market Requirements	10
3.1 Service Agreements	10
3.2 Project-specific Markets	13
3.3 Overall Market Requirements	13
3.4 Downstream Transportation Arrangements	18
4. Facilities	20
4.1 Overview	20
4.1.1 The Expansion Facilities	20
4.1.2 Alternative Sites for the Proposed Gas Plant	22
4.1.3 New Aitken Creek Gas Plant	22
4.1.4 Booster Stations	25
4.1.5 Pipelines	25
4.2 Project Management	27
4.2.1 Contracting Methods	27
4.2.2 Construction Safety	27
4.3 Westcoast Capital Cost Estimate	29
5. Land Use and Environmental Matters	31
5.1 Assessment Process	31
5.2 Early Public Notification	31
5.3 Land Use	33
5.3.1 Route/Site Selection	33
5.3.1.1 New Aitken Creek Gas Plant	33
5.3.1.2 Pipelines	33
5.3.2 Land Requirements	34

5.3.2	Land Requirements	34
5.4	Environmental Matters	34
5.4.1	Aitken Creek Gas Plant and Booster Station Upgrades	34
5.4.1.1	Air Quality and Acid Deposition	34
5.4.1.2	Noise	36
5.4.2	Aitken Creek Plant	36
5.4.2.1	Sulphur Management	36
5.4.2.2	Water Quality	37
5.4.2.3	Water Use	37
5.4.2.4	Waste Management	38
5.4.2.5	Soils	38
5.4.2.6	Vegetation	38
5.4.2.7	Wildlife	39
5.4.3	Pipeline Facilities	39
5.4.3.1	Geology and Soils	39
5.4.3.2	Vegetation	39
5.4.3.3	Wildlife	40
5.4.3.4	Fisheries	40
5.4.3.5	Archaeological and Heritage Resources	41
5.4.3.6	Cumulative Effects	41
6.	Socio-Economic Matters	43
6.1	The Local Infrastructure and Economy	43
6.2	Financing of Government Services	44
6.3	Local Hiring and Skills Training	45
6.4	Construction Camp Working and Living Conditions	46
7.	Financial Matters	48
7.1	Toll Treatment for the Proposed Facilities	48
7.2	Financing	53
7.3	Other Toll Matters	54
7.3.1	Liquids Products Stabilization and Fractionation Service	54
7.3.2	Heat Content	54
8.	Economic Feasibility	56
8.1	Economic Feasibility	56
8.2	Impact of Tolls on Consumers and Producers	57
9.	Disposition	59

List of Tables

2-1	Comparison of Estimates of Remaining Established Reserves and Undiscovered Potential	7
3-1	Service Agreements	11
3-2	Comparison of Expansion Treatment Service Agreement Volumes and Capacity at the New Aitken Creek Plant	12
3-3	Overall Forecast of Traditional Markets	14
3-4	Forecast Natural Gas Demand in Markets Served by Canadian Sourced Supply	15
3-5	Forecast Deliveries of Canadian Natural Gas to Major Markets East of British Columbia .	16
4-1	New Pipeline Facilities	26
4.2	Summary of Capital Cost Estimates for the Fort St. John Expansion Project	30

List of Figures

1-1	Westcoast Energy Inc. - Pipeline Systems Map	2
1-2	Fort St. John RGT Area Gathering, Processing and Transmission Facilities	3
2-1	Comparison of Westcoast's and NEB's Estimates of Total Daily Productive Capacity	9
4-1	Fort St. John Expansion Facility Location Map	21
4-2	New Aitken Creek Plant Preliminary Processing Block Diagram	24

List of Appendices

I.	Land Requirements and Status	60
II.	Terms and Conditions	62
III.	Order XG-W5-7-96	65

Abbreviations

Act	<i>National Energy Board Act</i>
AFUDC	allowance for funds used during construction
Amoco	Amoco Canada Petroleum Company Ltd.
Assessments	Environmental and Socio Economic Assessment Reports
bbl/d	billion of barrels per day
B.C.	British Columbia
Bcf	billion cubic feet
BC Gas	BC Gas Utility Ltd.
BCPCC	British Columbia Provincial Council of Carpenters
BCYT	British Columbia and Yukon Territories Building and Construction Trades Council
Board or NEB	National Energy Board
CanWest	CanWest Gas Supply Inc.
CH ₄	methane
CO ₂	carbon dioxide
CO	carbon monoxide
COFI	Canadian Council of Forest Industries
COFI et al	Canadian Council of Forest Industries, Methanex Corporation and Cominco Ltd.
DFO	Department of Fisheries and Oceans
EARP Guidelines Order	<i>Environmental Assessment and Review Process Guidelines Order</i>
EPN	Early Public Notification
EUG	Export Users Group
GLC	ground level concentration

ha	hectare
hp	horsepower
H ₂ S	hydrogen sulphide
IBEW	International Brotherhood of Electrical Workers (Local 213)
kg	kilogram
km	kilometre
kPa	kilopascal
kw	kilowatt
LDC	local distribution company
ℓ/min	litres per minute
LPSF	liquid products stabilization and fractionation
m ³	cubic metres
m ³ /d	cubic metres per day
MELP	B.C. Ministry of Environment, Lands and Parks
MMcfd	million cubic feet per day
MOE	Ministry of Environment
m ³ /yr	cubic metres per year
NEP	Northern Environmental Patriots
NGL	natural gas liquid
NO _x	nitrogen oxides
N ₂ O	nitrous oxides
Northwest Pipeline	Northwest Pipeline Corporation
NOVA	NOVA Gas Transmission
O.D.	outside diameter
PNG	Pacific Northern Gas Ltd.

ppm	parts per million
Province	The British Columbia Ministry of Energy, Mines and Petroleum Resources on behalf of the Province of British Columbia
PRRD	Peace River Regional District
psi	pounds per square inch
RGT	raw gas transmission
SO ₂	sulphur dioxide
SO ₄ ²⁻	sulphate ion
Society	Chetwynd Environmental Society
Soil Plan	Soil Conservation and Impact Mitigation Plan
Tcf	trillion cubic feet
T-North	Westcoast's Northern residue gas transmission line
TransCanada	TransCanada PipeLines Limited
T-South	Westcoast's Southern residue gas transmission line
U.A. (Local 170)	United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of The United States of America and Canada (Local 170)
µg/m ³	microgram per cubic metre
U.S.	The United States of America
VOC	volatile organic compounds
WCB	Workers Compensation Board of British Columbia
Westcoast, the Company, or the applicant	Westcoast Energy Inc.

Recital and Appearances

IN THE MATTER OF the *National Energy Board Act* ("the Act") and the regulations made thereunder;

IN THE MATTER OF an Application dated 6 October 1994, as amended, by Westcoast Energy Inc. for a Certificate of Public Convenience and Necessity pursuant to section 52 of the Act authorizing the construction and operation of certain additional facilities;

IN THE MATTER OF an Application by Westcoast for an Order pursuant to Section 58 of the Act to exempt certain facilities from the provisions of sections 30, 31, 33, and 47 of the Act; and

IN THE MATTER OF an Application by Westcoast for an Order pursuant to Part IV of the Act concerning the toll methodology applicable to the facilities applied for herein.

HEARD at Fort St. John, British Columbia on 6 February to 13 February 1995 and at Vancouver, British Columbia on 20 February to 10 March 1995.

BEFORE:

A. Côté-Verhaaf	Presiding Member
K. W. Vollman	Member
R. Illing	Member

APPEARANCES:

J. Lutes	Westcoast Energy Inc.
R. Sirett	
R. Dickson	British Columbia and Yukon Territories Building and Construction Trades Council, and International Brotherhood of Electrical Workers (Local 213)
C. D'Silva	B.C. Health Services
S. Torrence	B.C. Horticultural Coalition
B. Rogers	B.C. Provincial Council of Carpenters
C. McCool	B.C. Public Interest Advocacy Centre
W. Sawchuk	Chetwynd Environmental Society
D. Bursey	The Canadian Council of Forest Industries, Methanex Corporation and Cominco Ltd.

F. Weisberg	Export Users Group: IGL Resources Inc. Intermountain Gas Company Northwest Gas Company Northwest Natural Gas Company Washington Natural Gas Company Washington Power Company Cascade Natural Gas Corporation
S. Hartnell	Peace River County Environmental Protection Association
A. Johnstone	Northern Environmental Patriots
R. O'Brien	United Association of Journeymen & Apprentices of the Plumbing and Pipefitting Industry of the U.S. and Canada (Local 170)
A. S. Hollingworth	Aitken Creek Group: ATCOR Ltd. Blue Range Resource Corporation Canadian Natural Resources Ltd. ConWest Exploration Company Ltd. Murphy Oil Company Ltd. Norcen Energy Resources Limited North Canadian Marketing North Canadian Oils Petro-Canada Philips Petroleum Resources Ltd. Suncor Inc. Talisman Energy Inc. Tarragon Oil and Gas Ltd. Texaco Canada Petroleum Inc. B.C. Star Partners Union Pacific Resources Inc. Wainoco Oil Company Ltd.
C.B. Johnson S. Richards	BC Gas Utility Ltd.
R. Beattie	CanWest Gas Supply Inc.
S. R. Miller	Petro-Canada
D. A. Holgate	Tumbler Ridge Shippers Group Amoco Canada Petroleum Company Ltd. Imperial Oil Resources Mobil Oil Canada PanCanadian Petroleum Limited Phillips Petroleum Resources Inc. Talisman Energy Inc.

G. Hardcastle

Unocal Canada Limited

P. McCunn-Miller

Alberta Department of Energy

D. Sanderson

Province of British Columbia

J. Pelrine

J. Yardley

Peace River Regional District

B. de Jonge

Board Counsel

J. Hanebury

Chapter 1

Introduction

1.1 The Fort St. John Expansion Application, GH-5-94

On 6 October 1994, Westcoast Energy Inc. ("Westcoast", "the Company", or "the Applicant") applied to the National Energy Board ("the Board" or "the NEB") pursuant to Parts III and IV of the *National Energy Board Act* ("the Act") for a certificate of public convenience and necessity, pursuant to section 52 of the Act, authorizing the installation of two pipeline loops; an order, pursuant to section 58 of the Act, authorizing the construction of a new Aitken Creek plant, three compressor unit additions, and expansion of the Fort St. John Raw Gas Transmission ("RGT") system in British Columbia ("B.C."); and an order, pursuant to section 59 of the Act, requesting a rolled-in toll for services provided by the applied-for facilities. A series of amendments and supplements to its application were later filed by Westcoast including cost of service and toll forecasts.

As shown on the Westcoast system maps, Figure 1-1 and 1-2, the proposed Aitken Creek plant would be located in northeastern B.C., approximately 130 kilometres ("km") north from the town of Fort St. John, in a natural gas supply area that has been extensively developed. The proposed Aitken Creek plant, estimated to cost \$266 million, would be capable of processing raw natural gas with a hydrogen sulphide component which when processed would produce sales gas, liquid sulphur and a natural gas liquid ("NGL") condensate. The companion expansion of the Fort St. John RGT system, estimated to cost \$132 million, would increase the capacity of the system to allow for a redistribution of supply gas to the proposed Aitken Creek plant and the existing McMahon plant. The expansion of the RGT system would involve the installation of three compressor units and the construction of eight separate segments of pipeline and related facilities. Westcoast proposes to complete construction of the applied-for facilities and commence operation of the proposed Aitken Creek plant by 1 September 1996.

The Board issued Order GH-5-94 for Westcoast's Fort St. John Expansion application on 31 October 1994 setting out the Directions on Procedure for a public hearing. On 5 January 1995, the Board held a pre-hearing conference to address issues related to the hearing date, location, and the List of Issues. At the conference, BC Gas Utility Ltd. ("BC Gas") requested a change in the hearing date that was set to commence on 23 January 1995, at least insofar as tolling implications, market issues, economic feasibility and jurisdictional issues were concerned to allow more time to consider the evidence. A similar request was made by the British Columbia Ministry of Energy Mines and Petroleum Resources on behalf of the Province of British Columbia ("the Province"). The Export Users Group¹ ("EUG") and the group of the Canadian Council of Forest Industries, Methanex Corporation and Cominco Ltd.² ("COFI et al") were other parties that also supported the request.

¹ The "Export Users Group" comprised IGL Resources Inc., Intermountain Gas Company, Northwest Gas Company, Northwest Natural Gas Company, Washington Natural Gas Company, Washington Power Company and Cascade Natural Gas Corporation.

² During the hearing Methanex Corporation indicated that it had withdrawn its position regarding Westcoast's Fort St. John Expansion application and wished to have its name removed from the "COFI et al" group.

Figure 1-1
Westcoast Energy Inc.
Pipeline Systems Map

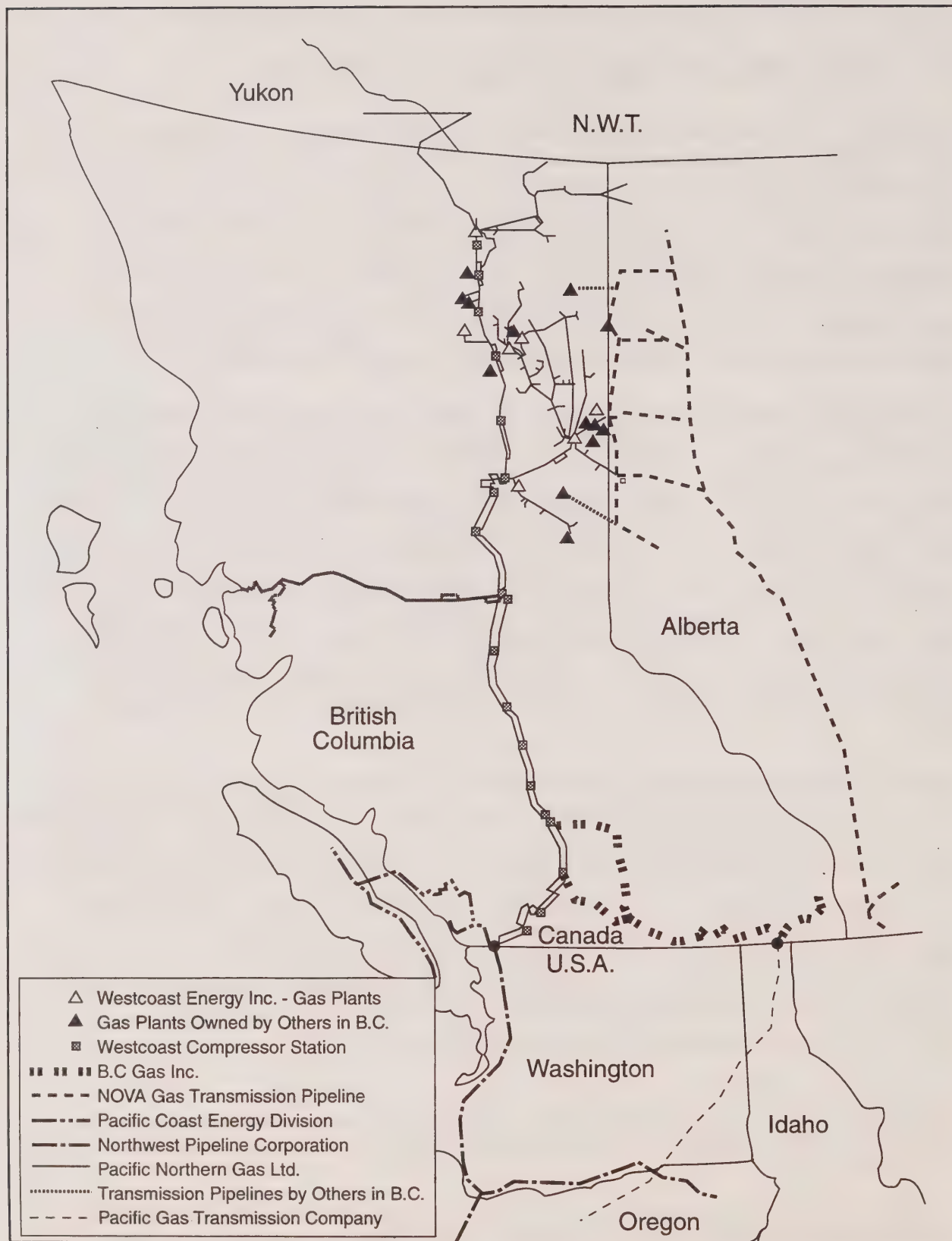
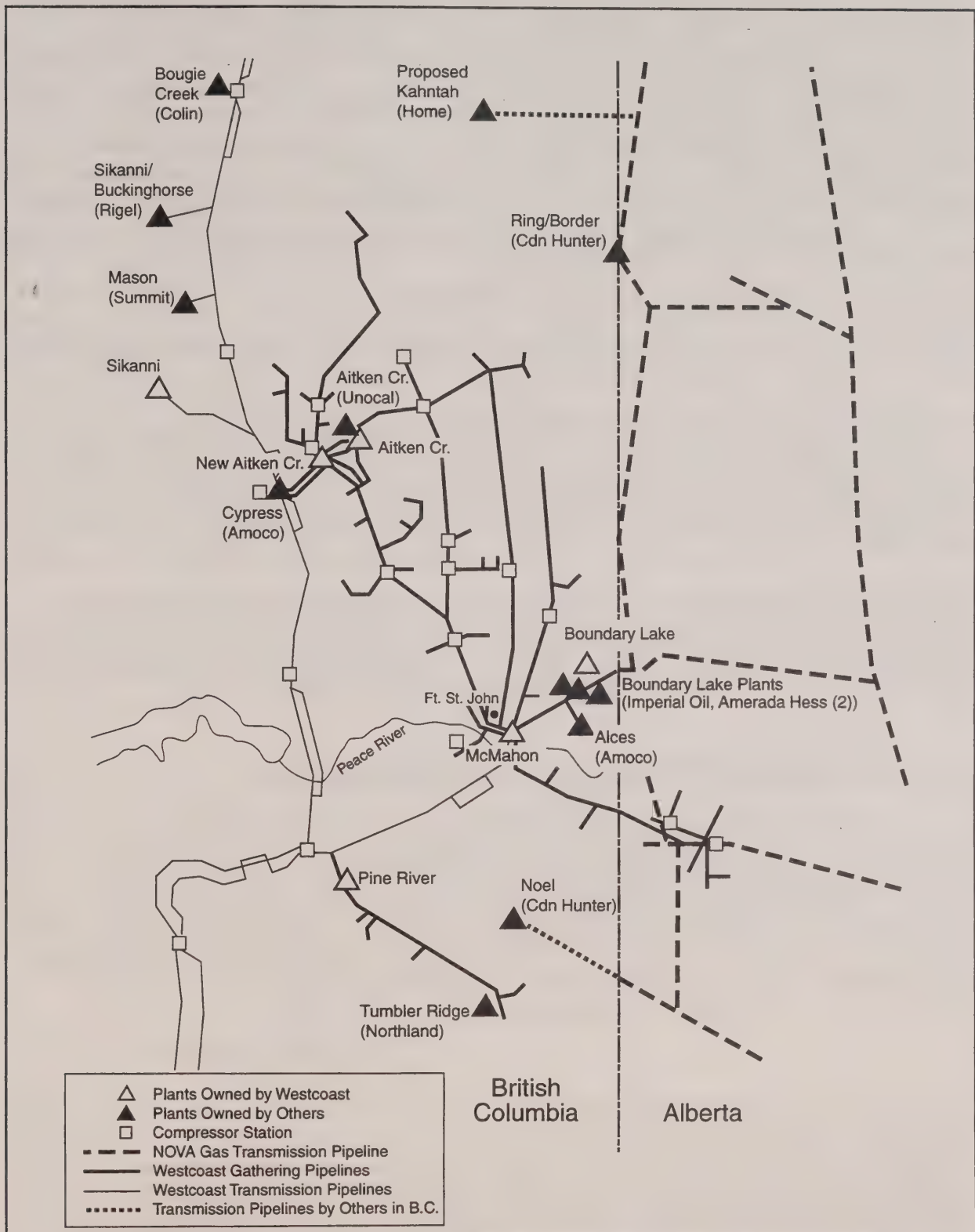


Figure 1-2
Fort St. John RGT Area
Gathering, Processing and Transmission Facilities



Shortly after the conference, the Board decided to delay the commencement of the public hearing in Fort St. John, B.C. to 6 February 1995.

At the start of the proceeding, arguments for several motions were heard. BC Gas requested that the Board dismiss Westcoast's Fort St. John Expansion and its Grizzly Valley Expansion applications for lack of evidence related to the rolled-in toll treatment of the applied-for facilities. The Grizzly Valley Expansion application is discussed later. The Board denied the motion for dismissal on the basis that there was evidence before it that was relevant to the issue of tolls and that the sufficiency of the evidence was a matter that should be determined during the proceeding. BC Gas also requested that Westcoast provide further and better responses to certain information requests and that Westcoast be required to update its information responses for all materials filed to reflect the postponement of the Grizzly Valley Expansion application. In its ruling, the Board first set out the purpose of information requests and criteria that it used to determine the adequacy of Westcoast's responses. The Board then reviewed the responses of all the information requests that were of a concern to intervenors and ruled on the adequacy of each of Westcoast's responses. Regarding the request to update information responses, the Board accepted Westcoast's undertaking to provide an Aitken Creek Stand-Alone Case, a market forecast update, and an impact assessment that reflected the costs and impacts of only the Fort St. John Expansion application.

The hearing in Fort St. John adjourned on 13 February 1995 after hearing evidence related to socio-economic, engineering, environmental, and gas supply issues. At the request of a number of interested parties, the hearing reconvened in Vancouver, B.C. on 20 February 1995 and continued until 10 March 1995 to receive evidence related to markets, finance, tolling, corporate policy issues, and final argument.

Prior to the GH-5-94 Hearing, BC Gas submitted a letter providing notice, pursuant to section 57 of the *Federal Court Act*, of its intention to put in question at the hearing the constitutional validity or applicability of the Act for the applied-for facilities. The Board heard submissions from parties on this issue during Argument at the end of the proceeding and reserved its decision¹.

1.2 The Grizzly Valley Expansion Application, GH-6-94

On 4 November 1994 Westcoast applied to the Board pursuant to Parts III and IV of the Act for authorization to construct and operate: the Tumbler Ridge Gas plant; two compressor units; an expansion of the Grizzly Valley RGT system; and a residue gas pipeline. The proposed Tumbler Ridge Gas plant, was estimated by Westcoast to cost \$529 million. The companion expansion of the Grizzly Valley RGT system, compressor unit additions and the residue gas pipeline was estimated to cost \$144 million. Westcoast proposed to complete construction of the applied-for facility and commence operation of the Tumbler Ridge gas plant by 1 November 1996.

¹ In May 1995 a majority of the Hearing Panel decided that the Board did not have jurisdiction over the facilities in respect of which the application was made, except for the proposed loop of the Aitken Creek pipeline that would connect the new Aitken Creek plant with Westcoast's main transmission line. The application was accordingly dismissed. Westcoast appealed this decision to the Federal Court of Appeal, which rendered a decision on 9 February 1996 setting aside the decision of the Board declining jurisdiction and directly it to decide the application on its merits.

The Board issued Hearing Order GH-6-94 for Westcoast's Grizzly Valley Expansion application and the hearing for the application was to be conducted immediately following the completion of the Fort St. John Expansion proceeding, with the exception that evidence related to: market; finance; tolling and corporate policy issues that were common to both applications would be heard during the proceeding for the Fort St. John Expansion application. However, just prior to the start of the hearing in Fort St. John, Westcoast submitted a letter to the Board indicating that, at the request of the producers requiring the facilities, the start-up would be delayed to 1 November 1997. Consequently, Westcoast requested to have the proceeding for the Grizzly Valley Expansion application deferred until early fall 1995. Although some parties had procedural concerns related to evidence that was common to both applications, there were no objections to Westcoast's motion to defer hearing of the Grizzly Valley Expansion application. The Board accepted Westcoast's request for deferral of the proceeding and requested that Westcoast apply for recommencement of the proceeding with at least 60 days notice.

1.3 Application for Early Site Preparation Work

On 16 December 1994, Westcoast applied for an order, pursuant to section 58 of the Act, authorizing the site preparation work for the new Aitken Creek plant. The Board invited interested parties to GH-5-94 to comment on the proposal for early site preparation prior to the consideration of the Fort St. John Expansion project application, and the appropriateness under the *Environmental Assessment and Review Process Guidelines Order* ("EARP Guidelines Order") of screening the site preparation application prior to screening the balance of the Fort St. John Expansion application.

In accordance with the EARP Guidelines Order, the Board conducted an environmental screening of the proposal, based on the application and found that the potentially adverse environmental effects that may be caused by the proposal and the social effects directly related to those environmental effects are insignificant or mitigable with known technology.

On 27 January 1995, the Board issued Order XG-W5-6-95 granting Westcoast the authorization to commence the site preparation work for the new Aitken Creek plant. However, Westcoast noted at the start of the hearing in Fort St. John that it had been unable to obtain the land permits from the Province of B.C. for the plant site and consequently would not be able to begin the site preparation until it satisfied the Province that it had received the Board's approval for the entire Fort St. John Expansion application. Westcoast indicated that this delay would result in a postponement of the in-service date of the proposed Aitken Creek plant from the original applied date of 1 April 1996 to 1 September 1996.

1.4 Environmental Reviews

The Board conducted an environmental screening of the applied-for facilities in compliance with the EARP Guidelines Order and ensured there was no duplication in requirements under the EARP Guidelines Order and the Board's own regulatory process. The Board has determined that the potentially adverse environmental effects which may be caused by the proposal, would be insignificant or mitigable with known technology. This conclusion, outlined in a separate Screening Document, represents a finding pursuant to paragraph 12(c) of the EARP Guidelines Order.

The Board's views formed pursuant to Part III of the Act in respect of the environmental and socio-economic effects of the applied-for facilities are set out in Chapters 5 and 6 of these Reasons for Decision.

Chapter 2

Gas Supply

2.1 Established Reserves

Westcoast submitted estimates of established gas reserves for the Fort St. John supply area which included estimates of reserves located in the Clear Hills field in Alberta. As shown in Table 2-1, Westcoast's estimate of established reserves is slightly lower than the Board's estimate.

Table 2-1
Comparison of Estimates of Remaining Established Reserves
and Undiscovered Potential¹
10⁹m³ (Tcf)

	Westcoast		NEB	
Remaining Established Reserves	82.7	(2.9)	83.4	(2.9)
Undiscovered Potential	218.0	(7.7)	208.5	(7.4)
Total	300.7	(10.6)	291.9	(10.3)

¹ As of 31 December 1993

Westcoast assigned estimates of remaining established gas reserves to 754 pools in 112 fields. Approximately 52 percent of the remaining established reserves are found in some 436 pools that are not producing and awaiting either connection or future demand. In assessing reserves additions, Westcoast prepares its own evaluation for reserves estimates and requires a minimum deliverability rate to qualify gas reserves. An economic test was not applied by Westcoast prior to recognizing reserves additions although Westcoast indicated that such a test would have validity in northeast British Columbia.

The Board's estimate of established gas reserves was based on an evaluation of 603 pools, of which 350 are not producing. These non-producing pools contain about 37 percent of the Board's estimate of remaining established reserves.

2.2 Undiscovered Potential

In addition to established reserves, Westcoast has assigned an estimate of remaining undiscovered gas potential of 218 10⁹m³ (7.7 Tcf) within the Fort St. John supply area. Westcoast adopted the NEB's resource assessment methodology in obtaining its own estimate of undiscovered potential.

The Board has developed its own estimate of undiscovered potential using stochastic methodology that utilizes various reservoir parameters, success rates, play areas and known pool areas. In establishing its estimate of undiscovered potential, the Board recognizes the uncertainty associated with estimates of this nature. The Board's estimate of remaining undiscovered potential of $208.5 \times 10^9 \text{ m}^3$ (7.4 Tcf) was taken at a statistical mean of 43 percent probability.

2.3 Productive Capacity

Figure 2-1 compares Westcoast's estimate of total productive capacity from producing and non-producing pools, and undiscovered potential in the Fort St. John area to the NEB's estimate of the total productive capacity for the same supply area. The Board's analysis of productive capacity is higher than Westcoast's during the initial years of the forecast and lower at the end of the forecast period. Figure 2-1 also compares both estimates of marketable gas productive capacity to the current and expanded gas plant capacities.

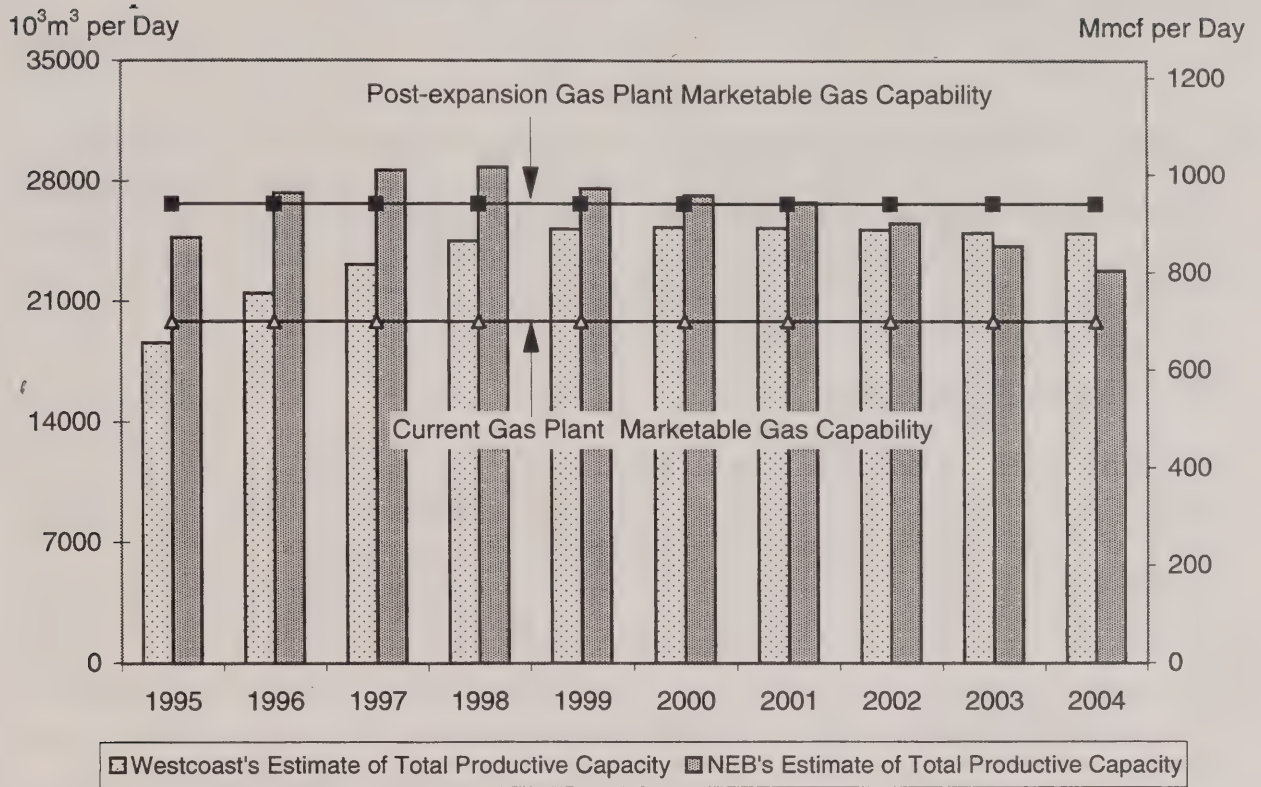
BC Gas expressed concerns regarding the adequacy of gas supply for reasonable long-term utilization of the proposed facilities but did not provide specific evidence in support of its view. BC Gas's concerns were related to: Westcoast's lack of economic testing; the extent of their reliance on trend gas; the recent change in drilling forecasting methodology; the potential reduction in drilling activity due to lowered natural gas prices; and the failure of Westcoast to account for the possibility of producers shutting-in supply given continued low natural gas prices.

Views of the Board

The Board's and Westcoast's estimates of established reserves are similar. The Board is satisfied that the combination of Westcoast's own assessment of reserves with its minimum deliverability criteria provide a fair evaluation for recognizing reserves additions.

The Board notes that the plant expansion is heavily reliant upon undiscovered potential which, by its nature, is somewhat uncertain. Westcoast's and the Board's estimates of undiscovered potential are similar and fall within a range of estimates that the Board finds reasonable.

Figure 2-1
Comparison of Westcoast's and NEB's Estimates
of Total Daily Productive Capacity



Chapter 3

Market Requirements

In support of its application, Westcoast filed: executed firm service agreements for both the RGT system and processing plant expansion capacity; project-specific market information provided by the expansion shippers pertaining to the incremental processed gas volumes; its long-term macro natural gas market forecast; and an affirmation that downstream transportation arrangements are either presently or will be in-place to enable the incremental sales gas volumes to reach the market.

3.1 Service Agreements

As indicated in Table 3-1, Westcoast filed executed five-year firm service agreements for RGT service totalling 10 065 10³m³/d (355 MMcfd) and ten-year service agreements for treatment service totalling 6 168 10³m³/d (218 MMcfd). However, Westcoast indicated that approximately 850 10³m³/d (30 MMcfd) of these expansion service agreement volumes will be processed at the McMahon plant, leaving 5 318 10³m³/d (188 MMcfd) of contracted volume available for the proposed Aitken Creek plant. Westcoast also indicated that this contracted volume is only 382 10³m³/d (13 MMcfd) less than the production capacity that would be provided by the expansion project. Although the proposed Aitken Creek plant capacity is 8 200 10³m³/d (290 MMcfd), the new plant must also fulfil the production contracted at the existing Aitken Creek plant as well as provide the new plant fuel gas requirement. As a result, the capacity available at the new plant for new contracted volumes is limited to 5 700 10³m³/d (201 MMcfd). Table 3-2 summarizes the shortfall in expansion service agreement volumes for the new plant.

Westcoast noted that as of 11 July 1994, the queue for RGT service behind the McMahon plant comprised service requests totalling 15 234 10³m³/d (538 MMcfd) and the queue for treatment at the McMahon plant comprised service requests totalling 21 618 10³m³/d (763 MMcfd).

BC Gas noted that the contracts with the expansion shippers for the proposed processing facilities are for only ten years, compared to an estimated economic life of the facilities of 40 years, and that after ten years, under-utilization risk rests with Westcoast and all of the users of its existing facilities. Additionally, BC Gas argued that if the supply and markets do not exist to the extent that Westcoast is forecasting, then there is a likelihood that contracts, which are held on the applied-for and existing facilities, may not be renewed.

In Westcoast's view, the terms of the service agreements are sufficient to support the facilities expansion and to protect the financial integrity of Westcoast's facilities.

Table 3-1
Service Agreements

Shipper	Raw Gas Transmission		Treatment	
	<u>10³m³/d</u>	<u>MMcfd</u>	<u>10³m³/d</u>	<u>MMcfd</u>
ATCOR	90.0	3.2	84.0	3.0
Blue Range	471.1	16.6	242.2	8.5
B.C. Star	460.1	16.2	424.5	14.8
Canadian Natural Resources	593.6	21.0	563.0	19.9
CanWest Supply	2 413.5	85.2	0.0	0.0
Chauvco Resources	420.0	14.8	394.5	13.9
ConWest Exploration	621.0	21.9	560.0	19.8
Czar	35.4	1.2	0.0	0.0
Encal	198.0	7.0	188.0	6.6
Excel Energy	200.0	7.1	168.6	6.0
Home Oil	54.0	1.9	50.0	1.8
Luscar	136.0	4.8	127.0	4.5
Morrison	317.9	11.2	295.0	10.4
Murphy	60.5	2.1	30.6	1.1
Norcen	42.0	1.5	36.5	1.3
Numac Energy	213.6	7.5	56.5	2.0
Petro-Canada	1 695.6	59.9	1 221.3	43.1
Phillips	112.0	4.0	103.0	3.6
Remington	154.0	5.4	141.0	5.0
Summit Resources	170.0	6.0	151.7	5.4
Suncor	200.0	7.1	190.0	6.7
Talisman	88.0	3.1	0.0	0.0
Tarragon	244.0	8.6	285.0	10.1
Texaco	158.4	5.6	141.6	5.0
Union Pacific	756.0	26.7	713.7	25.2
Wainoco	160.7	5.7	0.0	0.0
TOTAL	10 065.4	355.3	6 167.7	217.7

Table 3-2
Comparison of Expansion Treatment Service Agreement Volumes
and Capacity at the New Aitken Creek Plant
10³m³/d (MMcfd)

TREATMENT SERVICE AGREEMENTS		CAPACITY AT NEW AITKEN CREEK PLANT	
DESCRIPTION	SALES GAS VOLUME	DESCRIPTION	SALES GAS VOLUME
treatment service agreements	6 168 (218)	total plant capacity	8 200 (290)
less: processing at McMahon plant	850 (30)	less: existing Aitken Creek plant production	2 200 (78)
		less: fuel gas requirement	300 (11)
Total to New Aitken Creek Plant	5 318 (188)	Total Capacity Available	5 700 (201)
Uncontracted Aitken Creek Plant Capacity		383 (13)	

Views of the Board

The Board continues to place considerable importance in making its determination, on the existence of binding and unconditional service agreements for the entire capacity of the applied-for facilities. The Board also examines, concurrently, other factors in order to assess whether the applied-for facilities will be used at a reasonable level over their economic life and that the associated demand charges will be paid. In that regard, the Board notes that the lengths of term in the executed firm service agreements are consistent with Westcoast's Expansion Service Delivery Policy and its Raw Gas Transmission Facility Expansion Policy. Therefore, the Board concludes that the filed executed firm service agreements would support the need for the applied-for facilities. However, as a condition of approval, Westcoast would be required to ensure the new Aitken Creek plant is fully contracted for treatment service.

3.2 Project-specific Markets

Although neither Westcoast nor the expansion shippers provided final details of the specific markets proposed to be served by the incremental processed gas volumes, most of the expansion shippers provided Westcoast with information that reflected their understanding of the likely markets to be served. However, Westcoast noted that, in circumstances where expansion shippers and existing shippers are competing for what are becoming increasingly short-term markets, there is limited benefit in attempting to evaluate the specific markets to be served by the expansion shippers. Westcoast concluded that, in the context of a facility addition, it is important to evaluate the availability of gas markets for its entire system.

BC Gas asserted that expansion shippers' evidence provides virtually no information pertaining to project-specific markets or associated downstream transportation requirements.

The Aitken Creek Group¹ submitted that since the 31 October 1985 Agreement on Natural Gas Markets and Prices, the manner in which gas transactions occur has changed and that, in general, the length of term for gas sales contracts has become shorter. Consequently, the Aitken Creek Group agreed with Westcoast that it is only possible to assess the potential markets and the likelihood that the proposed facilities are used over their useful life by conducting a macro-analysis of the overall markets. In support of this assertion, the Aitken Creek Group also indicated that it is very difficult for expansion shippers to finalize sales agreements relating to facilities which might be built but, which have not yet been certified by the Board.

Views of the Board

The Board notes that the expansion shippers' evidence does not provide confirmation that project-specific markets exist or will exist for all the incremental gas volumes. The Board is cognizant that the natural gas market place has changed and is changing in a manner that does not easily allow for expansion shippers to have readily identifiable markets for future gas volumes associated with facilities which have yet to be built. Therefore, since the project-specific market information that was provided in the expansion shippers' evidence is limited, the Board places particular emphasis on binding and unconditional firm service agreements, and macro market assessments to ensure that the applied-for facilities would be used and useful over their economic life.

3.3 Overall Market Requirements

As indicated in Table 3-3, Westcoast provided a macro market forecast of natural gas demand for both domestic and export markets traditionally served by gas transported on its facilities. This forecast was for a ten-year period commencing in 1994 and ending in 2003. Westcoast submitted that this macro forecast was prepared on the basis of a bottom-up assessment in which market specific forecasts were

¹ The Aitken Creek Group comprised ATCOR Ltd., Blue Range Resource Corporation, Canadian Natural Resources Ltd., ConWest Exploration Company Ltd., Murphy Oil Company Ltd., Norcen Energy Resources Limited, North Canadian Marketing, North Canadian Oils, Petro-Canada, Philips Petroleum Resources Ltd., Suncor Inc., Talisman Energy Inc., Tarragon Oil and Gas Ltd., Texaco Canada Petroleum Inc., B.C. Star Partners, Union Pacific Resources Inc. and Wainoco Oil Company Ltd.

provided by end users served by the Westcoast system. Westcoast also provided its own assessment of potential gas demand for those provincial and export markets not included in the forecasts of each domestic and U.S. local distribution company ("LDC").

Westcoast noted that it took into consideration historical gas market data and also other available B.C. and export demand forecasts. Westcoast noted that it updated this market information through on-going discussions with its shippers, Canadian LDCs, Northwest Pipeline Corporation ("Northwest Pipeline"), major electric power generators, U.S. LDCs and other U.S. shippers. Additionally, Westcoast stated that it considered Fort St. John expansion shippers' marketing intentions in determining that deliveries of natural gas through the NOVA Gas Transmission ("NOVA") system to non-traditional markets (as reflected in Table 3-3) would be an important factor underlying the expected increase in deliveries by B.C. natural gas producers to markets outside of B.C.

Specifically, the Westcoast forecast indicated that total annual deliveries are forecast to increase at a rate of 3.1 percent per annum over the next ten-year period. Annual deliveries to markets outside B.C. are forecast to increase at the rate of 3.6 percent per annum, notably higher than the forecasted rate of increase for annual deliveries to B.C. markets of 2.4 percent per annum. Consequently, Westcoast anticipates that the share of throughput for markets outside B.C. will increase from 53 percent in 1993 to 56 percent in 2003. Westcoast noted that the anticipated growth in traditional markets over the forecast period far surpasses the incremental volumes that would come on-stream from the new Aitken Creek plant.

Westcoast provided further evidence of summaries of various studies and forecasts that it reviewed to assess the demand for natural gas in both Canada and the U.S. for the non-traditional markets accessed through the NOVA system. Westcoast concurs with these forecasts, displayed in Table 3-4 and Table 3-5, that natural gas demand growth in these non-traditional market regions will be large with Canadian gas deliveries to these markets expected to increase at the slightly greater rate of 1.8 percent per annum versus 1.6 percent per annum for traditional markets. On this basis, Westcoast argued that by the year 2000, the incremental increase from 1993 in delivered volumes from the Westcoast system to the NOVA system will be less than 15 percent of the total forecast increase in demand in Canadian and U.S. markets served from Western Canada.

Lastly, Westcoast acknowledged that the expansion shippers will be competing with the existing shippers for both new and existing markets. However, Westcoast asserted that competition in commodity markets is the very outcome that was anticipated from the efforts to deregulate gas markets, ongoing since 1985.

BC Gas submitted that the market assessment undertaken by Westcoast was inadequate. In support of this claim, BC Gas asserted that in completing its macro analysis of traditional markets, Westcoast relied upon the 1992 and 1993 Integrated Resource Plans of Pacific Northwest Utilities in lieu of more recent plans. Consequently, its forecasts would not reflect BC Gas's understanding that these utilities are attempting to achieve a more balanced supply portfolio between B.C., Alberta and U.S. production basins. BC Gas also noted that Westcoast conceded that uncertainty exists with respect to the ability of Westcoast to hold its market share in the U.S. Pacific Northwest states.

Table 3-3
Overall Forecast of Traditional Markets

MARKET SEGMENT	1993¹	1994	1995	1996	1997	2000	2003
	10⁶m³	Bcf	10⁶m³	Bcf	10⁶m³	Bcf	10⁶m³
B.C. MARKET							Bcf
Northeast	284	10	425	15	425	15	425
Pacific Northern Gas	978	35	1 048	37	1 076	38	1 246
BC Gas	5 419	191	4 929	174	5 156	182	5 977
Pacific Coast Energy/Centra Gas	538	19	595	21	850	30	1 530
Total B.C.	7 220	255	7 110	251	7 507	265	8 300
EXO - B.C.² MARKET							293
NOVA	656	23	906	32	1 299	46	1 853
Huntingdon Export Pipelines	340	12	680	24	893	32	893
Northwest Pipeline							
On-System Market	6 803	240	6 884	243	7 195	254	8 045
Off-System Market	482	17	425	15	623	22	737
Total Northwest Pipeline	7 285	257	7 309	258	7 790	275	8 725
Total Exo - B.C.	8 281	292	8 895	314	9 982	352	11 472
TOTAL THROUGHPUT	15 501	547	16 005	565	18 284	645	20 992

¹ Actuals

² EXO-B.C. means outside of B.C.

Table 3-4
Forecast Natural Gas Demand in Markets Served
by Canadian Sourced Supply
1993-2010

Market	Growth					
	1993 ¹		2000		2010	
	<u>10⁶m³</u>	<u>Bcf</u>	<u>10⁶m³</u>	<u>Bcf</u>	<u>10⁶m³</u>	<u>Bcf</u>
Canada (East of B.C.)	56 911	2 009	66 684	2 354	74 361	2 625
California	50 990	1 800	62 746	2 215	72 803	2 570
Midwest	119 912	4 233	127 475	4 500	143 622	5 070
Northeast	73 652	2 600	91 782	3 240	103 397	3 650
Total Demand	301 465	10 642	348 687	12 309	394 183	13 915
					47 222	1 667
					92 718	3 273

Sources:
 NRCan, Canada's Energy Outlook, October 1994.
 NRCan, Canadian Natural Gas Exports, January 1994.
 California Gas and Electric Utility, California Gas Report, 1994.
 Gas Research Institute, Baseline Projection Data Book, 1994.
 Petroleum Industry Research Associates, October 1994.

¹ Actuals

Table 3-5
Forecast Deliveries of Canadian Natural Gas to Major
Markets East of British Columbia
1993-2010

Market	1993 ¹		2000		2010		1993-2000		1993-2010	
	<u>10⁶m³</u>	<u>Bcf</u>	<u>10⁶m³</u>	<u>Bcf</u>	<u>10⁶m³</u>	<u>Bcf</u>	<u>10⁶m³</u>	<u>Bcf</u>	<u>10⁶m³</u>	<u>Bcf</u>
Canada (East of B.C.)	56 911	2 009	66 684	2 354	74 361	2 625	9 773	345	17 450	616
California	12 946	457	20 764	733	23 002	812	7 818	276	10 056	355
Midwest	25 467	899	27 138	958	30 481	1 076	1 671	59	5 014	177
Northeast	14 957	528	18 356	648	20 679	730	3 399	120	5 722	202
Total Demand	110 281	3 893	132 942	4 693	148 523	5 243	22 661	800	38 242	1 350

Sources:

NRCan, Canada's Energy Outlook, October 1994.
NRCan, Canadian Natural Gas Exports, January 1994.
Forecast for Midwest and Northeast for Year 2000.
assumes 1993 Canadian supply markets shares will be maintained.
Forecast for California, Midwest and Northeast for
Year 2010 assumes 2000 Canadian supply market share will be maintained.

¹ Actuals

As for movements east to the NOVA system, BC Gas questioned whether these were potential markets to the extent that there is no evidence of contracted or actual take-away capacity. Finally, BC Gas pointed out that just concluding the incremental gas volumes will find market is not sufficient to justify building the proposed facilities, insofar as the incremental gas only displaces existing supply already serving existing markets.

The EUG submitted that Westcoast has not provided sufficient evidence to demonstrate the need for these facilities, at this time, to the extent that the existing markets served by Westcoast do not need or want the applied-for facilities.

Additionally, the EUG pointed out that Westcoast, when it undertook the macro market assessment, conceded that it is challenged to forecast demand in markets in which it has no historical experience. Even in markets traditionally served by gas from Westcoast facilities such as the U.S. Pacific northwest states, there are unknown factors which are difficult to assess. Similar to BC Gas, the EUG pointed out the concern regarding displacement, noting Westcoast's testimony that incremental gas volumes will be competing for the markets which some producers may already serve.

Conversely, the Aitken Creek Group submitted that sufficient evidence has been provided in support of the adequacy of markets to absorb the incremental gas volumes. In fact, it is the Aitken Creek Group's position that Westcoast's macro market assessment may be somewhat conservative. Additionally, the Aitken Creek Group suggested that the executed firm service agreements provide further evidence that markets exist for the incremental gas volumes.

Views of the Board

The Board has not given weight to intervenor submissions that the applied-for facilities are not needed to serve existing markets and therefore should not be built. The Board is of the view that these submissions are short term in outlook. They do not recognize that the initial development of the Westcoast system would not have occurred without export markets. The development of the system has made a major contribution to the extension of gas service throughout the Province and to the development of the natural gas resource in northeastern B.C. The Board also notes the support of the Province for construction of these facilities.

The Board has considered Westcoast's macro market assessment of the overall markets that are accessible from the Westcoast system and is satisfied that the forecasts provided are reasonable for the purpose of determining the need for the applied-for facilities to serve viable, long-term markets. The Board believes that the macro market assessment, coupled with the executed service agreements, provides reasonable assurance that the applied-for facilities would be used and be useful over the long-term.

3.4 Downstream Transportation Arrangements

In its application, Westcoast indicated that other pipeline facility expansions will be required to move the residue gas associated with this expansion to market. Subsequently, Westcoast stated that it had

received executed expansion agreements for its northern residue gas transmission line ("T-North") service on the Fort Nelson mainline and its southern residue gas transmission line ("T-South") service. The expansion agreements for T-North service to Gordondale on the B.C./Alberta border have been forwarded to prospective expansion shippers for execution. Westcoast also indicated that as the lead time for new gas plant construction is much longer than that required for mainline capacity expansions, the appropriate T-North and T-South facilities will be built when required to enable incremental gas flows from the proposed facilities to match the market.

Regarding transportation arrangements downstream of its system, Westcoast stated that these have also been pursued by expansion shippers. Specifically, Westcoast noted that it had been informed by NOVA that requests have been received, for firm receipt capacity from the Westcoast system at Gordondale, which exceed in volume the Westcoast forecast of firm peak day deliveries to the NOVA system. With respect to peak day deliveries to the Northwest Pipeline system, Westcoast noted that Northwest Pipeline's take-away capacity at the Huntingdon interconnect is greater than the gas volumes that the Westcoast system can currently deliver to it.

BC Gas submitted that Westcoast's evidence lacked any meaningful discussion of the expansion capacity that will be required on the mainline transmission lines as a consequence of building and operating the proposed facilities. BC Gas asserted that it is unrealistic to speak of moving incremental gas volumes to market without addressing T-North and T-South facility expansion requirements. Specifically, BC Gas believes that Westcoast's T-South mainline capacity expansion plans are insufficient to allow the incremental gas to move to southern markets. BC Gas noted the difference between the proposed new processing capacity and the T-South take-away capacity despite the expansion shippers' desire for equivalent processing and transmission capacity.

BC Gas noted Westcoast's evidence that, to the extent that there is insufficient capacity to move the incremental gas south, any excess gas will move in an easterly direction. Again, BC Gas asserted that Westcoast did not provide evidence of contracted NOVA take-away capacity or even actual take-away capacity. Moreover, BC Gas suggested that even if the expansion shippers' incremental volumes gain access into Alberta, getting the volumes to extra Alberta markets may still be difficult due to the lack of take-away capacity from Alberta.

Views of the Board

The Board notes that the shorter lead time required for mainline capacity expansions, compared to gas plant installations, will enable appropriately sized mainline transmission capacity to be built as requested by shippers under the condition that the proposed facilities are deemed to be in the public convenience and necessity. The Board is also cognizant of the take-away capacity of the Northwest Pipeline and the NOVA system at their respective interconnections with the Westcoast system. Moreover, the Board is of the view that expansion shippers, in executing firm service agreements, acknowledge, inherently, their responsibility to arrange for appropriate downstream transportation service. Therefore, the Board believes that sufficient overall pipeline capacity does or will exist to service the market regions accessible from the Westcoast system.

Chapter 4

Facilities

4.1 Overview

Westcoast's application proposes that the new Aitken Creek plant process raw gas that is currently processed at the existing Aitken Creek plant along with raw gas volumes from the expanded Fort St. John RGT system. The expansion project will result in changes to the flow pattern of Westcoast's Fort St. John RGT system. Presently, only gas from the Laprise and Sojer areas are processed at the existing Aitken Creek plant while all other raw gas from the Fort St. John RGT system is processed at Westcoast's McMahon plant. The McMahon plant is capable of hydrocarbon liquid recovery and sulphur removal while the existing Aitken Creek plant has a small throughput capability relative to the McMahon plant, does not have liquid recovery capability, and has limited sulphur removal capabilities.

In its application, Westcoast specified the pipelines that will supply the proposed Aitken Creek plant, but indicated that the RGT system will have sufficient flexibility to accommodate changing supply patterns and could divert some portions of supply volumes between either the new plant or the McMahon plant, should that be required. This will ensure that the proposed facility additions would maximize the use of existing capacity in its Fort St. John RGT system, minimize the amount of new facilities required and generally optimize the utilization of the overall system.

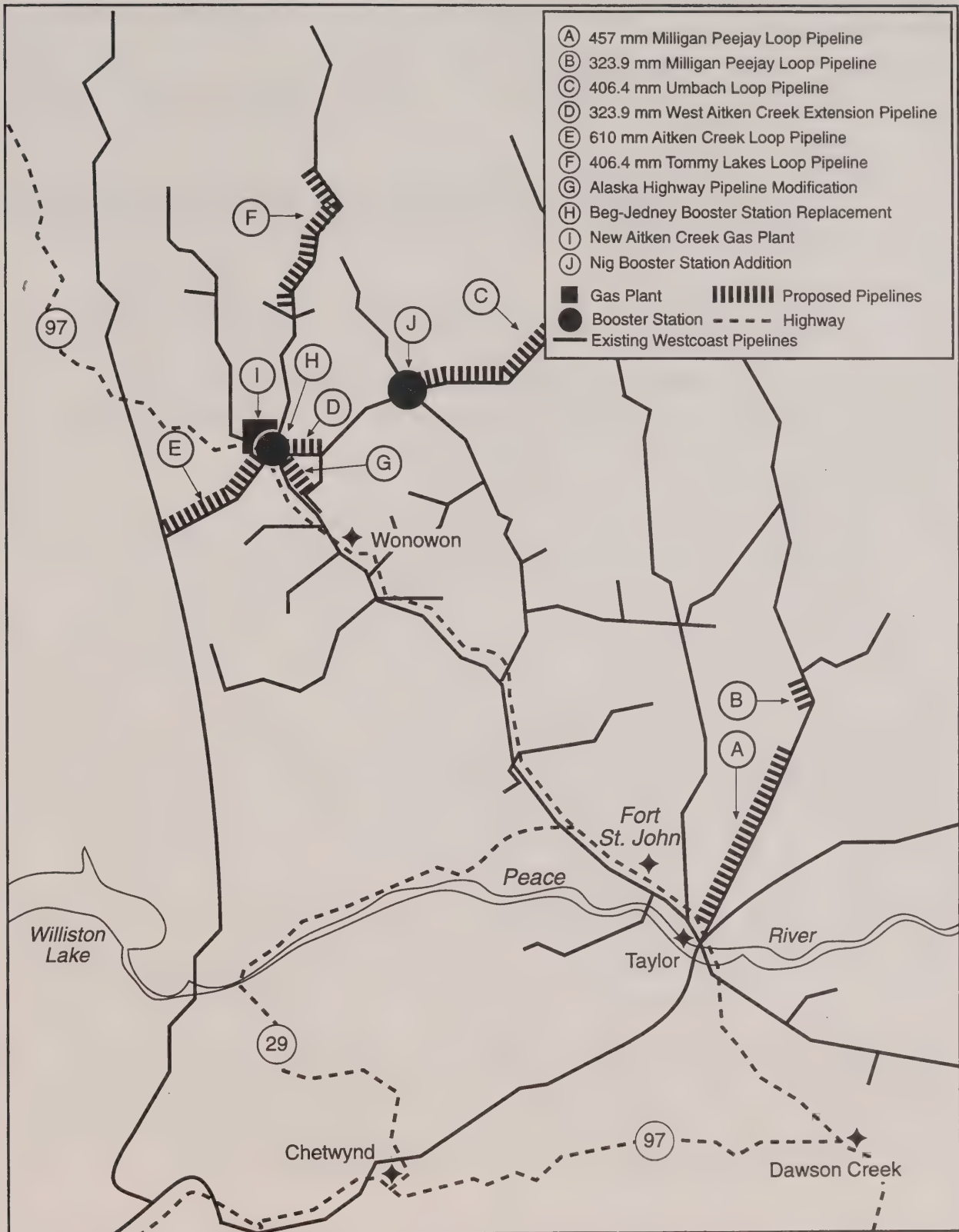
4.1.1 The Expansion Facilities

Westcoast's applied-for facilities application is comprised of:

- a new Aitken Creek gas processing plant with a raw gas throughput capacity of approximately $9\,050\,10^3\text{m}^3/\text{d}$ (320 MMcfd);
- a new Beg/Jedney booster station to be powered by two 5 190 kw (6 960 hp) compressor units;
- an additional 1 900 kw (2 550 hp) compressor unit at the existing Nig booster station;
- eight pipeline projects with diameters varying from 324 mm to 610 mm and totalling 167 kilometres, as described later in Table 4-1.
- the installation of flow control valves, flow measurement and pigging facilities.

Locations of the proposed facilities in Westcoast's Fort St. John RGT system are shown in Figure 4-1.

Figure 4-1
Fort St. John Expansion
Facility Location map



4.1.2 Alternative Sites for the Proposed Gas Plant

The existing McMahon plant site at Taylor, B.C. was Westcoast's second choice for location of the proposed new plant facilities. Westcoast's final decision to select the new Aitken Creek plant site rather than the Taylor site was based on the following considerations:

- the overall cost of the Fort St. John System expansion would be lower if the plant was built at the proposed new plant site as it would be the geographic centre of the supply area;
- if constructed at Taylor, the new plant would further add to the emission levels in the local air shed which are currently contributed to by a saw mill, pulp mill and the McMahon gas plant; and
- if the existing McMahon plant at Taylor was expanded, it would have the potential to increase the magnitude of production loss in the event of a catastrophic failure of the plant.

Westcoast stated that this location would minimize the length of pipeline, the number of booster stations, and total installed compressor power, thus ensuring that the environmental impacts and project costs would be reduced to the lowest possible level.

Views of the Board

The Board, in rendering its decision to approve Westcoast's application for early site preparation of the new Aitken Creek plant agreed with Westcoast's selection of plant sites for the handling of additional gas volumes from the expanded Fort St. John RGT system.

4.1.3 New Aitken Creek Gas Plant

The proposed new Aitken Creek plant would have approximately four times the capacity of the existing Aitken Creek plant that it would replace. The proposed new plant would be located within and adjacent to the present site of the existing Beg/Jedney booster station on a terraced mountainside in the vicinity of Milepost 121 of the Alaska Highway. The new plant would be capable of processing approximately $9\,050\,10^3\text{m}^3/\text{d}$ (320 MMcfd) of raw gas which would produce approximately $8\,200\,10^3\text{m}^3/\text{d}$ (290 MMcfd) of sales gas, $715\,\text{m}^3/\text{d}$ (4 500 bbl/d) of condensate and 160 tonnes per day of sulphur. Overall sulphur recovery efficiency is required to be 98.4 percent although Westcoast indicated that the design of the sulphur recovery facility in the plant would provide an efficiency rate of 99 percent. The estimated annual amounts of sulphur dioxide and carbon dioxide emissions that would be released to the atmosphere from the new plant are 1 867 and 365 729 tonnes, respectively.

Westcoast explained that the new Aitken Creek plant would be constructed in accordance with the requirements of all applicable legislations including the National Energy Board Act, applicable codes and accepted industry practice. In general, piping would conform to ASME/ANSI B31.3 Chemical Plant and Petroleum Refinery Piping and B31.1 Power Piping' 1993 edition. Pressure vessels would conform to Section VIII of the ASME Boiler and Pressure Vessel Code's 1992 edition.

The sales gas produced at the proposed Aitken Creek plant would be delivered to the Aitken Creek Loop pipeline for transportation to Westcoast's existing Fort Nelson mainline on the T-North system. The sulphur would be stored in a sulphur degassing storage pit, then removed by trucks contracted by the shippers. On-site emergency sulphur storage facilities would be provided and be capable of storing 30 days of sulphur production should the shippers be unable to remove the liquid sulphur. The condensate that would be recovered would be sent to storage, and shipped by a third party pipeline to Westcoast's McMahon gas plant in Taylor, B.C. where it would be equitably redistributed to Fort St. John RGT system shippers.

A process block diagram of the new Aitken Creek plant is provided in Figure 4-2. The proposed Aitken Creek plant would include the following major process units:

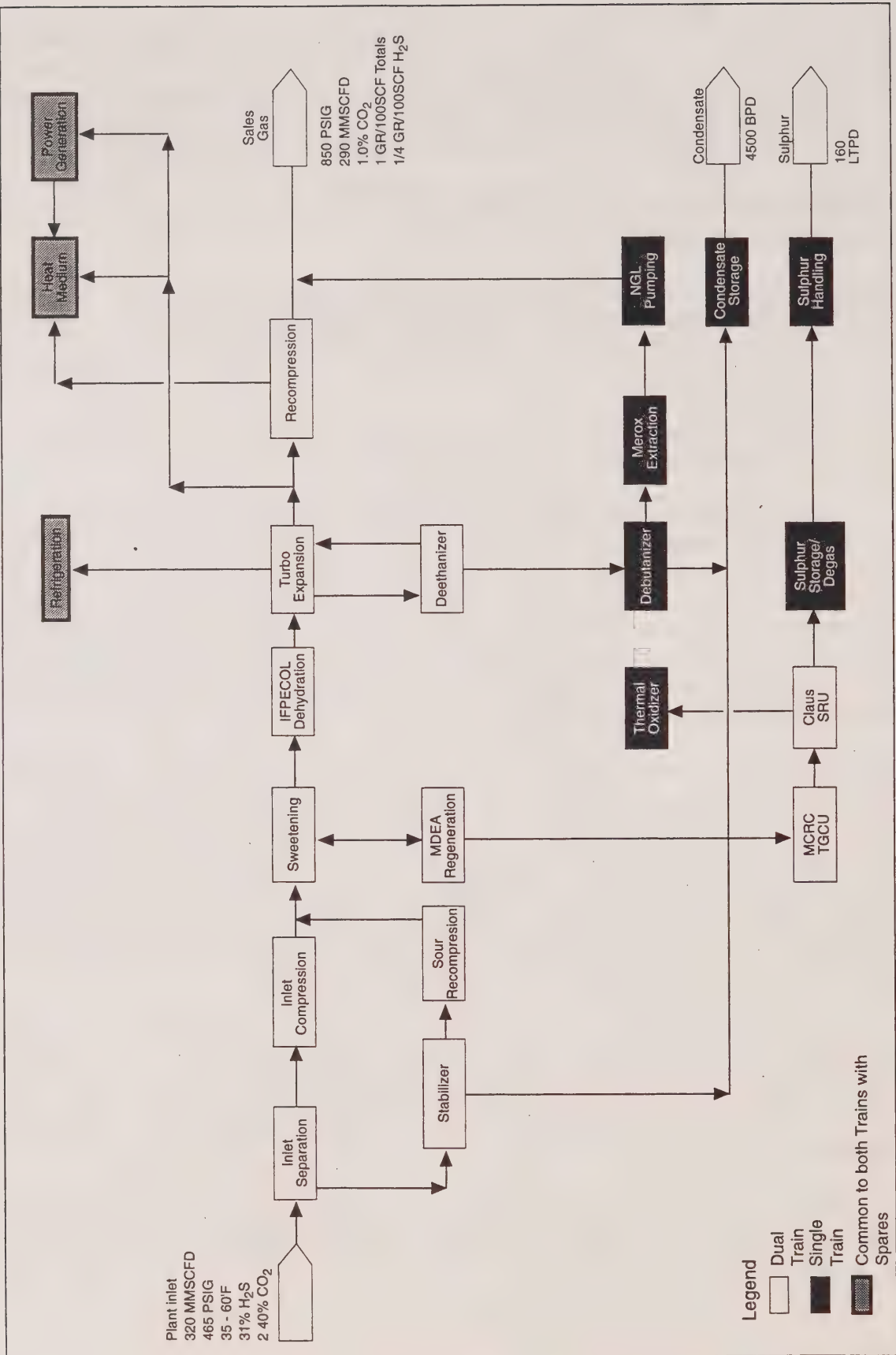
- Inlet Separation and Condensate Stabilization;
- Gas Sweetening;
- Gas Dehydration;
- Dewpoint Control;
- Sulphur Recovery and Tail Gas Treatment;
- Natural Gas Liquid ("NGL") Fractionation and Treatment; and
- Waste Disposal.

The utility and auxiliary facilities within the plant include: a heating medium utility process which recovers heat from the exhaust of the gas turbines in the plant; fuel gas powered gas turbine generators to provide the plant electrical power requirements; and assorted utilities which include the plant flare, closed drain system, firewater system, instrument and utility air, potable water, water treatment, building drain tanks and a fuel gas system.

The proposed NGL fractionation and treatment process utilizes a turbo-expander to extract the NGL from the sweet gas stream. The NGL is then separated into a common propane and butane product stream, and a condensate liquid stream. The common propane and butane product is treated to remove certain sulphur compounds (known as mercaptans) and then re-injected back into the sweet gas stream. Mercaptans removal is necessary to meet the sales gas product specifications. As discussed further in Chapter 7 of these Reasons for Decision, Petro-Canada expressed concern with Westcoast's proposed tolling methodology for the service provided by liquid product stabilization and fractionation ("LPSF"), which encompasses the NGL fractionation process described above.

Also as described in more details in Chapter 7 of these Reasons for Decision, CanWest Gas Supply Inc. ("CanWest") was concerned with the reduced heat content of the sales gas stream leaving the proposed Aitken Creek plant as compared to the heat content of sales gas leaving Westcoast's McMahon plant. The estimated heat content of the sales gas leaving the proposed Aitken Creek plant would be 38.5 gigajoules per 10^3 m^3 compared to 41.4 gigajoules per 10^3 m^3 at the existing McMahon plant. Westcoast stated that the heat content of the sales gas produced at the proposed Aitken Creek plant would be lower than at McMahon plant as the proposed Aitken Creek plant would utilize a turbo-expander which is more efficient in removing condensate liquids from the sales gas stream than the comparable McMahon plant process.

Figure 4-2



Views of the Board

The Board is of the view that the proposed Aitken Creek plant facilities are appropriate for the purposes of the proposed expansion of the Fort St. John RGT system. The Board is satisfied that the design and layout of the plant facilities is appropriate and safe for their intended purpose and that construction and commissioning would be closely monitored to ensure that all standards and design requirements are met. The Board, pursuant to section 58 of the Act, would therefore exempt such facilities from the requirements of leave to open. However, as a condition of the Board's approval, Westcoast would submit its pressure testing methods and procedures for approval and would notify the Board of its planned start-up date to enable the Board to perform an on-site audit of Westcoast's pressure testing records

4.1.4 Booster Stations

Westcoast submitted its design conditions, simplified process diagrams and layouts for both stations. It proposes to construct a new Beg/Jedney booster station and upgrade its Nig booster station. The existing Beg/Jedney booster station, which has a single, 1 025 kw (1 380 hp) reciprocating compressor unit, is not capable of handling the new design gas flow rate ($9\,050\,10^3\text{m}^3/\text{d}$) that would result from the expansion. Westcoast proposes to remove this station and construct a new station adjacent to the proposed new Aitken Creek Gas plant to provide plant inlet compression. Two turbine-driven centrifugal units would be installed which would have a combined rating of 10 380 kw (13 920 hp). The booster station controls would be integrated with the new Aitken Creek plant control system.

Extra compression at the Nig booster station would also be required for the expansion of Westcoast's Fort St. John RGT system. Westcoast proposes to add a 1 900 kw (2 550 hp) reciprocating compressor to the station in parallel to the two existing 1 340 kw (1 800 hp) reciprocating units.

Views of the Board

The Board is of the view that the additional compression facilities are appropriate for the purposes of the proposed expansion of the Fort St. John RGT system. The Board is satisfied that the design and layout of the compressor stations is safe for their intended purpose and that construction and commissioning would be closely monitored to ensure that all standards and design requirements are met. Therefore, the Board, pursuant to section 58 of the Act, would exempt such facilities from the requirements of leave to open. However, as a condition of the Board's approval, Westcoast would submit its pressure testing methods and procedures for approval and would notify the Board of its planned start-up date to enable the Board to perform an on-site audit of Westcoast's pressure testing records

4.1.5 Pipelines

As previously described, the proposed expansion involves eight pipeline projects, each requiring looping of existing pipelines, and comprising a total length of approximately 167 kilometres. As described in more detail in Chapter 5 of these Reasons for Decision, Westcoast proposes to route the

new loops in existing right-of-ways, when possible, to minimize the potential environmental effects of the pipeline construction. Table 4-1 summarizes some of the details for the proposed new pipelines.

Table 4-1
New Pipeline Facilities

<u>Line Name</u>	<u>Length (km)</u>	<u>Outer Diameter¹ (mm)</u>	<u>Wall Thickness (mm)</u>	<u>Grade</u>	<u>MOP (kPa)</u>
Milligan Peejay Loop	42.3	457.0	6.5	359	7 270
Milligan Peejay Loop	9.2	323.9	6.3	359	9 930
Umbach Loop Pipeline	44.9	406.4	6.4	359	8 070
Umbach Condensate Loop	2.5	406.4	6.4	359	8 070
	2.6	168.3	4.0	241	8 070
West Aitken Creek Extension	10.3	323.9	5.1	359	8 070
Aitken Creek Loop	22.2	610.0	8.3	414	8 070
Tommy Lakes Loop	33.3	406.4	5.5	359	6 890

¹ Some pipeline loops also include short sections of thicker wall pipe for road and river crossings, etc.

The expansion of the RGT system would require the crossing of several creeks and tributaries where Westcoast proposed to utilize conventional surface crossing techniques (i.e. flume or dam and pump). Of more significance are the Milligan-Peejay Loop and the Umbach Loop which would both cross the Beaton River. The geotechnical evaluation of the river crossing for the Milligan-Peejay Loop determined that this crossing by directional drilling would not be possible at the location and that a conventional surface crossing would be required. A similar evaluation of the crossing for the Umbach Loop showed that a directional drilling would be possible but Westcoast determined that such a technique at the location would involve considerable risks and that a conventional surface crossing in the winter period would be the more acceptable crossing alternative.

Views of the Board

The Board is of the view that the design and configuration of the proposed pipelines are appropriate and safe for their intended purpose. Westcoast would be required to seek approval pursuant to section 47 of the Act for leave to open the applied-for new pipelines. Also, Westcoast would be required to provide the Board, 30 days prior to commencement of construction of the Milligan-Peejay and Umbach Loops, with details of the crossing techniques, slope stability design and mitigative measures that it would use for the river crossings.

4.2 Project Management

4.2.1 Contracting Methods

Westcoast proposes to provide overall project management but that each site contractor company would act independently and be responsible for its contractually defined scope, schedule of work and own employees. All site contractors would be responsible to Westcoast's resident construction manager who would be assisted by a Westcoast staff of on-site inspectors, accountants, schedulers, engineering personnel, materials coordinators, safety supervisors and quality control supervisors. Westcoast's project manager would be responsible for the overall expansion project including project cost and schedule control.

The trades and crafts unions, comprising of the British Columbia and Yukon Territory Building And Construction Trades Council ("BCYT"), British Columbia Provincial Council of Carpenters ("BCPCC") and United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the U.S. and Canada (Local 170) ("U.A. (Local 170)") expressed concern about Westcoast's preference to tender its construction contracts by invitation rather than by open public bids. The unions believe that this process leads to the hiring of contractors who use non-union or captive union employees at lower wage rates and therefore, they requested that Westcoast's projects be subject to public tender. Westcoast maintains that it is more effective to tender by invitation from a list of pre-selected contractors who have proven abilities in the performance of work in their area of expertise.

The unions also requested that fixed-price bids be used by Westcoast rather than fixed fee/bonus reimbursable target price bids since they believe that the latter are more likely to result in cost overruns. Westcoast indicated that the reimbursable bids are more appropriate than fixed-price contracts for major site grading, foundation mechanical and electrical work since the contracting method allows for bidding at an earlier stage of engineering completion and results in smaller costs incurred for contractor profit margins. However, Westcoast also indicated that it would invite numerous additional fixed-price contracts for smaller works. Westcoast stated that given the level of engineering design completed and its previous experience, reimbursable bids provide the most cost and time effective approach for this project.

Views of the Board

The Board is of the view that Westcoast's method of contracting for this project is reasonable and appropriate. With respect to the arguments for the use of fixed-price bids to construct the new plant presented by the unions, the Board is not persuaded that their proposal, if adopted, would generate significant economic benefits over the method of contracting used currently by Westcoast.

4.2.2 Construction Safety

Westcoast indicated that it would be responsible for training its own employees in safety matters and training contractor employees in specific operating hazards associated with gas plants. However, its contractors are also directly responsible for their workers and their training in construction procedures and methods. On the plant site, all contractor personnel would receive a comprehensive safety

indoctrination by Westcoast prior to commencing work. Westcoast indicated that it would ensure that all contractors have their own safety program which satisfies Westcoast's safety requirements, and that the contractors would work within the parameters of their safety programs. Westcoast indicated that it provides a professional on-site safety manager to coordinate safety activities and would employ full-time staff safety supervisors to monitor work practices. Within the camp, first aid would be available 24 hours per day in accordance with Workers Compensation Board of British Columbia ("WCB") requirements.

The trades and crafts unions expressed considerable concern about a number of safety issues. They referred to a large number of safety infractions that had occurred during the Pine River plant expansion. Westcoast maintained that its safety record at Pine River, as represented by loss-time frequency, was four times better than that of the British Columbia average for construction.

The BCYT considers that because Westcoast takes overall responsibility for the project construction process and Westcoast falls under the Board's jurisdiction, that the WCB would not be able to exercise its authority on the overall construction project. The BCYT believes that the split of jurisdiction, between the Board and the WCB, may result in a lack of overall safety monitoring. It therefore, requested that the Board include a condition in the certificate to submit the entire project contract to open bidding for a general contractor as opposed to several contractors, so that the WCB would be more effective in enforcing site safety. Westcoast indicated that such a measure would not solve the split jurisdiction problem since Westcoast would still be responsible to the Board for on-site safety while the WCB has jurisdiction over every contractor.

The BCYT was also concerned that Westcoast's safety incentive bonus plan is a mechanism to encourage employees not to report accidents and that it promotes the practice of injured workers reporting to work for light duty. The BCYT asked the Board to impose a condition which would restrain Westcoast and its contractors from implementing any safety incentive program that would inhibit the reporting of safety incidents. Westcoast noted that both it and the WCB encourage injured workers to return to work to perform light duties if it is agreed to by the examining medical doctor.

The BCYT believes that the Board and the WCB should undertake joint inspections of the proposed Aitken Creek plant to ensure better overall safety monitoring. The BCYT also asked: that the Board, in consultation with the WCB and Westcoast, develop clear safety guidelines, programs and standards for the construction at Aitken Creek; that Westcoast removes from its bidder list any contractors with marginal or unacceptable safety records; and that Westcoast disclose to the Board a Pine River safety management audit report prepared for Westcoast by its consultant.

The BCYT in its final argument recommended that Westcoast put into place a comprehensive and proactive safety program to address the issue of split federal/provincial jurisdiction over workplace safety.

In response to some of these concerns and at the request of the Board, Westcoast undertook to provide the Board with a more detailed construction safety manual for contractors, prior to the commencement of construction, that relates only to plant construction.

Views of the Board

The Board believes that the present safety management structure is adequate to minimize the risks related to construction. The Board would like to emphasize, that as project manager, Westcoast is responsible for the coordinated implementation of its contractors' safety measures and training.

The Board notes that as a condition of the Board's approval, Westcoast would submit its revised gas plant construction safety manual to the Board prior to construction.

The Board will consult with the WCB to determine the possibility and benefits of a closer working relationship for the inspection of the construction site.

With respect to the recommendations and potential conditions for approval as set out by BCYT, the Board is of the view that such requirements are not supported by sufficient evidence and would therefore not be appropriate.

4.3 Westcoast Capital Cost Estimate

Westcoast provided a capital cost estimate of \$397.6 million for the proposed expansion facilities, as summarized in Table 4-2. Neither the Goods and Services Tax nor the B.C. property purchase tax have been included in these estimates.

Westcoast indicates that the cost estimates are based on its experience in the design, construction and operation of pipelines, booster stations and gas processing plants in British Columbia. Costs for the proposed facilities were estimated using databases of recent costs for similar facilities, published cost data and data provided by contractors. In the case of the proposed gas plant, Westcoast indicated that the costs for approximately half of the major equipment required were determined from price quotations received from equipment vendors. Project costs would be controlled by monthly reports comparing actual and forecast costs against the project control cost estimate. Monthly actual and forecast costs would be provided by Westcoast construction management and accounting personnel, Westcoast's engineering consultants, and Westcoast's head office departments.

The EUG and B.C. Gas expressed concern with the potential for an overrun in Westcoast's cost estimate for the proposed Aitken Creek plant. Westcoast indicated that the cost estimate for the proposed facility has a plus or minus 30 percent level of accuracy and was determined by a factored estimating method. Westcoast determined that an omissions and contingency allowance of \$28.1 million, which is equivalent to 11.8 percent of the total cost estimate for the plant (minus the omission and contingency allowance), would be sufficient to ensure that within a 95 percent confidence level the cost estimate would not be overrun. The omission and contingency allowance was determined on the basis of a Monte Carlo simulation using various cost elements that contribute to the plant cost estimate.

Table 4-2
Summary of Capital Cost Estimates for the
Fort St. John Expansion Project
\$000

COST CATEGORY	Aitken Creek Plant	Beg/ Jedney Booster Station	Nig Booster Station	Milligan- Peejay Loop P/L 457 mm	Milligan- Peejay Loop P/L 323.9mm	Umbach Loop P/L	West Aitken Creek P/L	Aitken Creek Loop P/L	Tommy Lakes Loop P/L	Alaska Highway P/L
Land and Land Rights	100 105,573	19,083	10,180	858 6,621	111 1,085	706 7,698	148 1,101	373 5,001	552 4,259	30 1,346
Materials Installation	74,925	4,000	3,900	8,631	1,300	8,610	1,485	5,065	5,890	842
Engineering, Inspection and Miscellaneous	38,615	2,300	1,975	1,407	324	1,409	436	1,010	1,154	218
Total Direct Cost	219,213	25,383	16,055	17,517	2,820	18,423	3,170	11,449	11,855	2,436
Engineering, Overhead and Supervision	2,500	800	800	1,139	183	1,200	206	744	770	120
Omissions and Contingencies	28,087	2,574	1,639	1,766	300	1,971	329	1,178	1,261	195
AFUDC	15,700	2,643	1,106	478	97	506	95	429	414	49
Total Cost	265,500	31,400	19,600	20,900	3,400	22,100	3,800	13,800	14,300	2,800

TOTAL = 397,600

The EUG and B.C. Gas added that Westcoast's past performance for its expansions at Pine River and McMahon plants were a more likely predictor of the potential for a cost estimate overrun because the new Aitken Creek plant estimate was only a factored cost estimate. Westcoast stated that the construction of the new Aitken Creek plant was a new stand-alone plant that would be without the complexities of construction at an operating plant site.

BCYT requested that Westcoast increase its engineering design completion from 75 percent to 90 percent prior to tendering construction contracts to permit the use of fixed-price bidding to allow for better cost estimates and cost control.

Westcoast indicated that it would prepare a new control cost estimate in April, just prior to construction, and that it would more accurately reflect the costs related to the new Aitken Creek plant.

Views of the Board

The Board is concerned by the level of accuracy of the new Aitken Creek plant cost estimate since it was prepared on the basis of a factored estimate. The Board is not convinced by the Monte Carlo simulation that the 11.8 percent contingency is sufficient to avoid a cost overrun on an estimate that is plus or minus 30 percent accurate. The Board would require Westcoast to submit its revised control estimate for the new Aitken Creek plant prior to construction.

Chapter 5

Land Use and Environmental Matters

5.1 Assessment Process

Westcoast submitted environmental and socio-economic assessment reports ("the Assessments") under a covering letter dated 6 October 1994 in support of its application. Westcoast adopted the recommendations contained in the Assessments to prevent or mitigate any adverse environmental effects resulting from the construction and operation of the applied-for facilities. Westcoast also undertook to adhere to the policy statements, mitigative measures and procedures provided in its Environmental Protection Manual - Pipeline Construction (September, 1992).

The Assessments included a description of the environmental setting, an assessment of the probable adverse environmental effects of the proposal, and recommendations to prevent or mitigate any adverse environmental effects resulting from the applied-for facilities. A Mitigation Plan, which included the recommended practices and procedures to prevent or mitigate specific adverse environmental effects, was provided for each of the proposed pipeline loops. In general, the Assessments provided information on land use, soils, agricultural capability/productivity, vegetation, fisheries, wildlife, water crossings, forestry, heritage resources, recreation, noise levels and air quality.

The environmental and directly-related social effects of the project were considered concurrently under two separate processes:

- (a) an examination of the project pursuant to the Board's mandate under Part III of the Act;
and
- (b) an environmental screening of the application pursuant to the EARP Guidelines Order.

The environmental screening was conducted concurrently with the GH-5-94 proceeding pursuant to the Board's Directions on Procedure dated 31 October 1994, as amended. The Board's environmental review pursuant to Part III of the Act is detailed in this chapter.

5.2 Early Public Notification

As part of its application process, and consistent with the Board's *Memorandum of Guidance Concerning Early Public Notification of Proposed Applications*, Westcoast started an extensive public consultation program on 10 May 1994. The Early Public Notification Program ("EPN") included advertisements (with maps) which were placed in local newspapers and correspondence with landowners, municipalities, provincial officials, provincial government agencies and the local public.

The following describe Westcoast's EPN efforts:

- Westcoast advised the public of Northeastern British Columbia of the proposed Fort St. John Expansion project through an eight page tabloid sized supplement printed the week of 24 July 1994 in six regional newspapers. The supplement was revised and reprinted the week of 13 September 1994 and was distributed to individuals and at public meetings. A mailing list was developed so that future issues could be provided to individuals and organizations that expressed an interest.
- Discussions between municipal, federal and various provincial government agencies commenced in June 1994. Following these meetings, the B.C. Ministry of Energy, Mines and Petroleum Resources established a Coordinating Committee for the purpose of providing "meaningful guidance to Westcoast from local, provincial and federal agencies". The committee first met on 3 August 1994 and subsequent meetings allowed Westcoast to address the concerns of various agencies in the early stages of project development.
- Consultation was carried out with the Wonowon Advisory Planning Committee of the Peace River Regional District on an average of once a month starting in August 1994. Westcoast will continue to attend committee meetings until all components of the project are complete.
- Community Open Houses were held in Fort St. John, Rose Prairie and Wonowon in July and August, 1994. The events were advertized in newspapers, fliers, and on radio. Westcoast's Fort St. John area system was displayed and an overview of the Fort St. John Expansion Project provided. Key staff members made presentations and answered questions. The media were invited to the Open Houses and interviews of the presentation team were recorded and later aired on Cable 10 and 5 TV on different dates and times.
- Discussions have been held between May and September 1994 with the representatives of the three Aboriginal communities potentially affected by the proposed project (Doig River Indian Band, Blueberry River Indian Band and Halfway River Indian Band). The project was presented to the members of Aboriginal communities of the northeast in Fort St. John on 6 September 1994.

Views of the Board

The Board is satisfied that Westcoast has notified and adequately discussed the proposed application with parties having a direct interest in the project. The Board notes, however, that the labour unions were not included in the early stages of the consultation process for the proposed project. The Board notes that groups which have expressed concerns with previous projects and which could reasonably be expected to have an interest in a proposed project, should be contacted as early as possible. While the unions have had an opportunity to present their concerns through the hearing process, the Board expects that Westcoast would involve the unions at the early planning stage for any future projects.

5.3 Land Use

5.3.1 Route/Site Selection

The Fort St. John Expansion project would involve the construction of a number of facilities as described in Chapter 4 of these Reasons for Decision. The locations of the facilities are shown in Figure 4-1.

5.3.1.1 New Aitken Creek Gas Plant

In selecting the candidate sites, Westcoast indicated that it gave consideration to the environmental impacts and the cost of development at the potential sites. Key factors considered include:

- (a) proximity to the raw gas supply system;
- (b) availability of the residue gas system for delivery of the process gas;
- (c) distances to existing transportation infrastructure;
- (d) proximity to housing, schools, stores and recreation facilities for plant personnel; and
- (e) extent of existing industrial development.

Chapter 4 of the Reasons for Decision provides an overview of Westcoast's proposed plant site options and rationale for the selection of the new Aitken Creek plant site.

5.3.1.2 Pipelines

Westcoast stated that all of the proposed pipelines would loop existing pipelines. Westcoast indicated, however, that diversions/deviations may be required in areas where slope stability may be a problem. In addition, diversions/deviations could be required where there are existing production facilities, roads, and other structures or obstacles.

Westcoast submitted that the selection of the proposed route location was based on the following criteria:

- (a) Construction/Operation Criteria:
 - (i) tie-in points,
 - (ii) construction/operation difficulties,
 - (iii) access,
 - (iv) future system expansion, and
 - (v) cost;
- (b) Biophysical Considerations; and
- (c) Land Use Considerations.

Views of the Board

The Board is satisfied with the site/route selection criteria used in the determination of the proposed pipeline routes. The Board finds the general routes proposed by Westcoast to be acceptable.

5.3.2 Land Requirements

Westcoast stated that it will require fee simple, new permanent easements and temporary work space. Appendix I sets out the land requirements by pipeline project.

Views of the Board

The Board finds that Westcoast's anticipated land requirements for plant and pipeline construction, installation, and operation are reasonable and justifiable. As the necessary land rights have yet to be acquired, the Board would require that Westcoast, as a condition to any approval, provide evidence that it has secured the necessary authorization for the rights-of-way.

5.4 Environmental Matters

In its application, Westcoast identified a number of environmental effects which could result from the construction and operation of the proposed facilities. Those effects, and mitigative measures proposed by Westcoast were presented in its environmental assessment and subsequent submission. Additional information was also requested and obtained by the Board regarding certain site-specific environmental effects and the mitigative measures proposed.

5.4.1 Aitken Creek Gas Plant and Booster Station Upgrades

5.4.1.1 Air Quality and Acid Deposition

Westcoast submitted an analysis of the atmospheric emissions expected from the proposed Aitken Creek gas plant and the related Nig Booster Station. The existing Beg/Jedney Booster Station would be integrated into the Aitken Creek plant.

At the proposed Aitken Creek plant, emissions of sulphur dioxide ("SO₂"), hydrogen sulphide ("H₂S"), nitrogen oxides ("NO_x"), carbon dioxide ("CO₂"), methane ("CH₄"), nitrous oxide ("N₂O"), volatile organic compounds ("VOC"), and carbon monoxide ("CO") were examined. At the Nig Booster Station, emissions of NO_x, SO₂, and CO₂ were considered. These emissions could have an adverse effect on air quality, and the environment. Atmospheric SO₂ and NO_x are also precursors in the formation of acid rain, which contributes to the acidification of soils and lakes in sensitive areas.

CO and greenhouse gases (i.e., CO₂, CH₄, N₂O) would be emitted from the facilities. Total emissions were estimated using published emission factors. Although these greenhouse gases are not presently regulated, Westcoast has committed to address the greenhouse issue through measures approved under the National Action Program on Climate Change. Emissions of VOCs from a number of sources at the proposed plant site are relatively small and would not have a measurable effect.

Westcoast examined the potential effects of continuous SO₂ and NO_x emissions using air quality dispersion models. The models are used widely in air quality assessment and were approved by the British Columbia Ministry of Environment, Lands and Parks ("MELP"). To provide input to these models, an analysis of the climatology of the area was performed. Westcoast projected that under worst case conditions, using the one year data set, the maximum SO₂ ground level concentration ("GLC") would be 351 µg/m³. This is below the Provincial Level A Objective and the Federal Ambient Objective of 450 µg/m³.

Emissions of NO_x from the proposed Aitken Creek plant and the Nig Booster Station were examined and dispersion models were used to predict the GLC for a worst case scenario. The peak concentration was projected to be well below the Federal Ambient Objective for NO_x at both facilities.

A number of concerns have arisen in relation to the potential impacts of flaring emissions. Westcoast examined the maximum GLC of SO₂ which would be expected during emergency flaring events at the proposed Aitken Creek plant. For flaring of 1 hour duration, the maximum GLC for SO₂ in worst case dispersion conditions was projected to be 2 266 µg/m³, averaged over 1 hour. This is well above the Provincial Level A Objectives and above the one hour exposure level of 1 820 µg/m³ at which damage to vegetation could be expected. Westcoast stated that conditions leading to these elevated levels of SO₂ would likely be limited to less than 1 percent of the potential hours based on the frequency of occurrence of worst case meteorological conditions (using 1991 data). Westcoast stated that they expected flaring incidents to be limited to four times per year, each with a duration of 10 minutes. Under such conditions Westcoast indicated that the maximum one hour average GLC for SO₂ would be less than the Provincial Level A Objective.

Westcoast has committed to establishing an air quality monitoring program which would include a monitoring station to measure SO₂ and H₂S. This program would include monthly reporting of any exceedances of provincial air quality objectives. As the process used to select the location of the monitoring station is an important element in determining the effectiveness of the monitoring program, Westcoast agreed to provide the Board with the criteria to be used in siting the air quality monitoring station to ensure that the site chosen would provide representative data.

Concern was expressed by the Northern Environmental Patriots ("NEP") and the Peace Country Environmental Protection Association ("PCEPA") that flaring practices could cause negative effects on human health.

Westcoast examined the potential for the oxides of sulphur and nitrogen to transform into an acidic state and to be deposited in the vicinity of the proposed Aitken Creek plant. The potential for this acid deposition was evaluated using the ADEPT2 model developed by Alberta Environment, for use in areas similar to the proposed Aitken Creek facility. Westcoast completed its analysis using a long term climatological data base from the closest meteorological observation stations. Westcoast also examined background acid deposition data from Beaverlodge, Alberta, the closest site for which such data were available.

The estimates of predicted sulphur deposition rates were 13.8 to 15.7 kg SO₄²⁻/ha/yr. This range is within the limit of 20 kg SO₄²⁻/ha/yr recommended by the Canadian Council of Resource and Environment Ministers and is deemed to be protective of moderately sensitive aquatic ecosystems. The Western and Northern Canada Interim Acid Deposition Critical Loadings Task Group had examined the sensitivity of aquatic soil systems to acidification. The soils and lakes surrounding the proposed Aitken Creek plant are in the lowest acidification sensitivity class. Therefore, Westcoast has

concluded that acidification potential of the emissions from the proposed Aitken Creek plant would be low, with a limited area likely to be impacted. Westcoast has proposed to conduct a baseline monitoring program of the soils and surface waters in the vicinity of the plant. As well, a precipitation pH monitoring program would be conducted for at least one year to assess acid deposition. Two precipitation monitoring sites are proposed by Westcoast, one in an unaffected area, and one located near the location of the maximum predicted sulphate deposition.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures and the Board's satisfaction with Westcoast's response to the proposed condition regarding the site selection criteria for the monitoring station, the potentially adverse environmental effects on air quality would be insignificant or mitigable with known technology.

With regard to concerns expressed by NEP and PCEPA, the Board considers Westcoast's proposed monitoring program to be acceptable, given the expectation that emergency flaring be limited to a small number of short duration events which would ensure that there would be minimal risk of negative health effects.

5.4.1.2 Noise

Westcoast noted in its application that a consulting firm had been retained to conduct a facility boundary noise survey as part of the Company's assessment. Westcoast, in response to a request from the Board, undertook to file the expected noise emission levels at the fence line of the applied-for new Aitken Creek plant and the upgraded Nig and Beg/Jedney Booster Stations.

Views of the Board

The Board notes that the expected noise levels have not yet been filed. However, the Board is of the view, given that the applied-for facilities would meet industry standards, and that the Board would condition any approval to include a monitoring program, that any noise effects would be insignificant or mitigable with known technology.

5.4.2 Aitken Creek Plant

5.4.2.1 Sulphur Management

The new Aitken Creek plant would be a full capability gas processing plant including a 160 tonnes per day sulphur recovery unit. The overall sulphur recovery efficiency would be 98.4 percent. Sufficient sulphur storage capacity would be required to permit normal plant operation. Sulphur would be pumped to the truck loading rack for transport off-site. A block storage area would be developed for on-site storage of the sulphur, however, it would be an emergency facility and would only be used in the event of a protracted interruption of sulphur hauling that would otherwise cause the plant to shutdown.

Westcoast has agreed to develop and conduct baseline and operational monitoring programs for groundwater in consultation with the Department of Fisheries and Oceans ("DFO") and MELP for sites in the vicinity of the proposed sulphur handling and blocking area.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, and the commitment made to DFO for monitoring, any potentially adverse environmental effects related to sulphur management would be insignificant or mitigable with known technology.

5.4.2.2 Water Quality

Westcoast submitted that the proposed new effluent treating facilities would ensure plant liquid wastes would be treated and released in strict accordance with the regulations and objectives of MELP including Level A discharge criteria. The proposed Aitken Creek plant design would incorporate source control and recycling systems to reduce the quantity of effluent requiring treatment to an absolute minimum.

Process effluents would be collected in tanks for temporary storage and then treated to meet the provincial level of effluent criteria. The proposed disposal of the treated effluent is by spray irrigation to a forested land site. Westcoast is presently considering potential spray irrigation areas in consultation with MELP. Westcoast proposes to undertake a field study to obtain data required to proceed with final design. Westcoast, in consultation with DFO, has committed to the development and implementation of a monitoring program to confirm compliance with Provincial Level A Objectives for all discharges and groundwater monitoring in the vicinity of the spray irrigation area to detect any contamination.

Views of the Board

The Board would require Westcoast to file the final design specifications for the spray irrigation system, including details of the site location, operating procedures, and the monitoring program.

In the Board's view, based on Westcoast's proposed mitigative measures, commitments to DFO, and the Board's proposed condition, any potentially adverse effects on water quality would be insignificant or mitigable with known technology.

5.4.2.3 Water Use

The proposed Aitken Creek plant would require 18.5 l/min of fresh make-up water for process and domestic use, which includes the requirements for fire fighting. The annual water use at 100 percent load would be approximately 10 000 m³/yr. The plant would have a 2 400 m³ potable water storage tank. The plant water requirements are based on the incorporation of water conservation, reduction, and reuse principles into the plant process design, thus yielding the minimum plant make-up water requirements.

Westcoast submitted that one supply option for potable water would be to transport water by truck to the plant site on a monthly basis. The other option would be an on-site potable water supply well. This would be subject to a groundwater exploration and development program to locate an aquifer having acceptable quality acid production capability. If an on-site groundwater well is used as a source of potable water, a regular water quality and quantity monitoring program would be implemented, and water level and pumping records would be maintained.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, any potentially adverse environmental effects on groundwater would be insignificant or mitigable with known technology.

5.4.2.4 Waste Management

Wastes generated at the proposed Aitken Creek plant could have potentially adverse environmental effects if not handled and disposed of appropriately. Westcoast stated that all wastes which cannot be recycled or re-used on site would be disposed of in an approved manner. A temporary on-site waste storage building would be designed to conform to the requirements of the Provincial Special Waste Regulation (B.C. Reg. 63/88, as amended), and approval would be obtained from MELP prior to commencing construction. Westcoast undertook to file with the Board a copy of its Waste Management Manual which characterizes all wastes generated by the operating facilities, defines special waste classifications, regulatory requirements, and provides reference information.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, any potentially adverse environmental effects of wastes generated at the proposed Aitken Creek plant would be insignificant or mitigable with known technology.

5.4.2.5 Soils

The soils at the proposed Aitken Creek plant site display a moderately thin, mineral topsoil layer plus a surface organic capping of leaf litter. Salvage within the majority of the site would employ a two-lift system, separating the topsoil from the underlying clayey subsoil/spoil. The topsoil would be stockpiled for use as a surface dressing during site restoration.

Views of the Board

With regards to soils, in the Board's view, the separation and preservation of the topsoil resource would ensure that any potentially adverse effects on soils would be insignificant or mitigable with known technology.

5.4.2.6 Vegetation

The entire study area has been affected by previous construction including pipeline facilities, highways, and access roads. Approximately 40 hectares of mixed upland forest would be cleared for the plant site and kept largely clear of vegetation. Any commercially valuable timber would be salvaged and any non-commercial trees or slash would be disposed of. Due to the area's history of fires and changes caused by intensive human use, the loss of vegetation is not considered significant from an ecological perspective. The edge of the clearing would be stabilized by planting medium height shrubbery and erosion would be controlled by seeding to a grass mixture.

Views of the Board

In the Board's view, any incremental effect on the study area of the loss of vegetation would be insignificant or mitigable with known technology.

5.4.2.7 Wildlife

Wildlife habitat loss would result from the clearing of the project site and there would be temporary alienation of further habitat due to sensory disturbances associated with intensive construction activity. The creation of alternate habitat types through the provision of a grass and shrub buffer would reduce the effects for some species, however, ungulates and bears would likely vacate the immediate area. Due to the homogeneity of the vegetation types in the general area, species displaced as a result of the project would likely find alternate suitable habitat.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, any potentially adverse environmental effects on wildlife would be insignificant or mitigable with known technology.

5.4.3 Pipeline Facilities

5.4.3.1 Geology and Soils

The proposed pipeline projects would encounter a variety of surface materials including bedrock, glacial tills, sandstones, shale, conglomerate, glaciofluvial sands, and organic deposits. The terrain varies from flat river valley bottoms to steep mountain slopes. Westcoast acknowledged the potential for slope stability problems as well as surface erosion following construction surface disturbance. Westcoast proposes to establish controls for surface, subsurface and ditch line water flows on slopes which pose stability problems, and to revegetate disturbed lands as a final stabilizing measure. Westcoast is developing a Soil Conservation and Impact Mitigation Plan ("Soils Plan") which would include site and soil type specific mitigative measures to address soil mixing, topsoil loss, compaction and erosion.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures including the development and filing of the Soils Plan, any potentially adverse environmental effects of the pipeline facilities on geology and soils would be insignificant or mitigable with known technology. The Board, however, would require Westcoast to file the Soils Plan prior to construction.

5.4.3.2 Vegetation

Vegetation loss would result from widening of the existing right-of-way where required depending on construction needs or other limitations. The pipeline projects would require the clearing of approximately 237 ha of forest and scrubland cover types and result in grass dominated communities. Merchantable timber would be salvaged and any non-commercial trees or slash would be disposed of in a manner and at a time required by the B.C. Ministry of Forests.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, any potentially adverse environmental effects on vegetation would be insignificant or mitigable with known technology.

5.4.3.3 Wildlife

Construction of the pipeline facilities would potentially have an adverse effect on wildlife in the project area. Westcoast submitted that the potential effects include sensory disturbance, habitat alienation, blockage of seasonal or daily movements, habitat alteration and fragmentation, increased access (and associated hunting and poaching pressures), and direct project-related mortalities.

The Canadian Wildlife Service, by letter dated 10 February 1995, expressed concerns regarding several avian species, including warblers, insectivorous birds and waterfowl.

Westcoast indicated that the study area was inspected by fixed-wing aircraft and helicopter, that numerous reports, including previous studies in the area, were reviewed and that MELP was consulted for information relating to wildlife use and associated concerns. Westcoast made observations on the kind, distribution and extent of habitat types and assessments were made of biological productivity and wildlife carrying capacity of habitat types. Sightings of wildlife species were also noted.

Westcoast stated that it would be discussing further habitat enhancement plans with MELP. Westcoast also stated that the only reports of rare and endangered species, listed by the B.C. Conservation Centre, within the study area are sightings of two rare warblers in the Taylor Flats area.

The creation of alternate habitat types through the provision of a grass and shrub buffer would reduce the negative effects for some species, however, ungulates and bears would likely vacate the immediate area in the short term. Due to the homogeneity of the vegetation types in the area, species displaced as a result of the project would likely find alternate suitable habitat.

Westcoast noted that because of the relative lack of waterbodies and wetlands in the area, that these are considered sensitive habitats. Accordingly, avoidance of waterbodies, maintenance of buffer strips of natural vegetation, and extreme care with ditching along any nearby alignments would be practiced to minimize any adverse effects.

Westcoast indicated that access development and access management is one of the most significant issues with respect to wildlife. Westcoast is actively involved in a steering committee forming part of a multi-party and multiple industry group considering the issue of access and access management in northeastern British Columbia. Westcoast would utilize existing access as much as possible and render inoperable other access roads after the completion of construction.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, any potentially adverse environmental effects on wildlife would be insignificant or mitigable with known technology.

5.4.3.4 Fisheries

Westcoast conducted an assessment of fish habitat at stream crossings along the proposed pipeline routes and Ministry of Environment ("MOE") and DFO stream survey cards were prepared for each site sampled. Photographs were taken from the air and the ground to record existing conditions. The methodology for gathering habitat information and assessing fish presence followed the methods required by MELP (B.C. Environment, 1994).

Westcoast provided a Stream Crossing Procedure and Impact Mitigation Report (January 1995) which provided a detailed assessment of site conditions, construction specifics, and extensive development of mitigation measures. The document also provided further information in response to information requests from DFO and other involved agencies. By letter dated 1 February 1995, DFO advised the Board that Westcoast had agreed to numerous resolutions and commitments for mitigation and monitoring which would ensure that impacts to fish and fish habitat would be insignificant or mitigable with known technology. DFO provided documentation which detailed the commitments and undertakings, and requested that the Board incorporate the measures as a condition to any Board approval.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures, the responses to information requests, and Westcoast's agreement with DFO, any potentially adverse environmental effects on fisheries would be insignificant or mitigable with known technology. However, as a condition of approval the Board would require Westcoast to comply with its undertakings and commitments to DFO.

5.4.3.5 Archaeological and Heritage Resources

Westcoast submitted that an archaeological site inventory was conducted including a field-ground assessment for all the pipeline routes. There were a number of sites and potential sites including some affected by previous construction, located along the routes, Westcoast committed to undertake further site assessment at these locations prior to construction.

Views of the Board

In the Board's view, based on Westcoast's proposed mitigative measures and the Board's proposed condition, any potentially adverse environmental effects on archaeological or heritage resources would be insignificant or mitigable with known technology. However, the Board would require that prior to construction of the affected pipelines, Westcoast file the results of further archeological and heritage resource site assessments to be conducted at the high potential locations.

5.4.3.6 Cumulative Effects

Cumulative environmental effects can occur when activity, such as pipeline construction, occurs and creates changes in the environment which accumulate or interact with the environmental effects of other projects or activities that have been or will be carried out.

The Chetwynd Environmental Society ("the Society") expressed concerns with regard to the cumulative effects of oil and gas development in northeastern British Columbia. The Society noted that the reports tabled by Westcoast in support of its application do not deal with the results of the producer's activities associated with the project.

The B.C. Ministry of Energy, Mines and Petroleum Resources ("the Province") speaking on behalf of the Province of British Columbia, stated that it has considered the level of exploration and development which will be necessary to support the proposed plant, the economic and environmental impacts of that exploration and development, and of the construction and operation of the facilities. The Province concluded that the project is in the provincial public interest and that the necessary level

of exploration and development can be sustained over the assumed lifetime of the facilities, without violating environmental safeguards.

Westcoast stated that the proposed pipelines would be buried and largely located adjacent to existing rights-of-way. The lines are relatively short, which would minimize any potential impacts due to ecosystem fragmentation or space crowding. Westcoast indicated that the construction would not increase access into wildlife areas that presently have limited access and submitted that the proposed project area has a high capacity to assimilate any additional effects associated with the construction, provided that all appropriate mitigative procedures are implemented.

Views of the Board

The Board acknowledges that oil and gas exploration, and development has had environmental effects in the region, and will likely continue to do so. Specific evidence on the nature or extent of project-related, cumulative effects was not put forward during the GH-5-94 hearing. The Board notes that there are some areas of energy resource development not under its jurisdiction, and that agencies of the Province of British Columbia are responsible for matters such as well development, operation and site maintenance, and producer compressor station siting and construction. The most appropriate route for consultation on these and other issues falling within provincial responsibility is with the provincial agency directly concerned.

Chapter 6

Socio-Economic Matters

Westcoast submitted in its application a socio-economic assessment based upon consultations with local authorities and interest groups. The assessment included a profile of the Peace River Regional District ("PRRD"), its municipalities, rural areas, economic sectors, social services, recent history, demographics, funding, and growth. The profile described the employment situation in the various sectors and the associated labour and employment patterns. The assessment also considered the impact of the project on economic development, labour, in-migration, housing, education, health, infrastructure, and law enforcement.

6.1 The Local Infrastructure And Economy

The PRRD expressed concerns about the overall effect of the new Aitken Creek gas plant on the local infrastructure and the delivery of social services. These concerns included:

- an increase in the crime rate, especially liquor offences;
- effects on the housing vacancy rates and rental inflation;
- a potential increase in regional unemployment rates due to an influx of non-residents seeking work;
- demands on schools and the Fort St. John Hospital; and
- demands on existing refuse sites to service construction and camp waste disposal requirements.

The PRRD also suggested that a far more extensive cost-benefit analysis should have been undertaken to determine the effects upon the communities.

In response to these concerns Westcoast stated that:

- an increased rate of crime is not anticipated to result from the Fort St. John Expansion and that two-thirds of the workforce would be housed in on-site camps with recreational facilities and 24 hour security;
- although approximately 60 percent of project labour would come from outside of the region, only one-third of the out-of-region workers would live in town, and that Westcoast would commit to providing additional accommodation if necessary;
- during construction, first aid stations, attendants, ambulances and a helicopter for serious situations would be provided, and that Westcoast would continue to consult with the Fort St. John Hospital;
- the influx of children during construction and operation would represent only 0.5 percent of the total student population; and

- it would also undertake to discuss construction and camp waste volumes and disposal with the PRRD as project planning develops, but noted that the disposal of effluent and solid waste from the construction camp would be in accordance with provincial and PRRD regulations.

In final argument the PRRD stated its support of Westcoast's application with the recommendation that the Board's approval should be conditional on Westcoast's provision of a storefront office in Fort St. John. In response, Westcoast noted that it already has an office at Charlie Lake and a 24-hour phone number.

Views of the Board

The Board is of the opinion that the socio-economic assessment performed by Westcoast sufficiently identified and addressed the local impacts of the project. While there may be effects on social services and aspects of the local economy, most of the effects would be short term and mitigable.

The Board acknowledges the concerns raised by the PRRD. However, the Board is not convinced, based on the evidence provided, that there would be any significant problems directly associated with the project. The Board further notes Westcoast's undertaking to discuss provisions for waste disposal with the PRRD.

6.2 Financing of Government Services

The PRRD expressed concerns that its residents would have to pay higher tax rates for long term infrastructure development and higher service costs for the effects of industry development located outside the municipal tax boundaries of Fort St. John and Dawson Creek. The PRRD noted that these communities have only half the average industrial tax base of all communities in the province. It was further noted that while these industries pay taxes to the province, the rates are lower than municipal rates and only a quarter of the proceeds are remitted to the municipalities by the Province of British Columbia. Consequently, the financing of increased municipal services caused by industrial expansion falls upon the local residential and commercial ratepayers. The PRRD felt strongly that this situation is inequitable.

The PRRD has a proposed Memorandum of Understanding with the Province of B.C. for an additional tax levy for capital development on the region's industrial tax base, and for the incorporation of major industrial properties into local municipalities.

Views of the Board

The Board notes the PRRD's initiative to seek an agreement with the Province of B.C. with respect to taxes on projects within its region. The Board further notes that the issues of an additional tax levy on the region's industrial base and changes to municipal tax boundaries are a provincial matter.

6.3 Local Hiring and Skills Training

The representatives of the local communities of the PRRD together with the trades and crafts unions that are active in the area, BCYT, BCPCC, and U.A. (Local 170), stressed the importance of local hiring by Westcoast's contractors and the opportunity for local workers to enroll in apprenticeship programs. It was stressed that the tendency of Westcoast's contractors to use "helpers" rather than registered apprentices was detrimental to the systematic training of new workers in the skilled trades and the development of a skilled local work force base. Westcoast maintained its policy is to encourage its contractors to hire as many local workers as possible while maintaining the appropriate level of expertise required for the work. Westcoast recognized that if local participation rates are high, local workers will have the opportunity to improve skills and seek more remunerative employment. Westcoast indicated that it is agreeable to look at ways of improving workers' access to training programs in the future.

Union representatives challenged Westcoast's ability to monitor its contractors' local hiring and the definition of local hire that Westcoast's contractors utilize in providing local hire statistics. It was requested that Westcoast televise upcoming construction projects on a local television bulletin board and advertise tradesmen's positions in British Columbia newspapers. Westcoast maintained that local hiring could be monitored through listed telephone numbers and the living-out allowance, and that local unemployment rates would provide a check upon the unreasonable hiring of outsiders. The U.A. Local 170 stated that non-local "trades helpers" at Westcoast's Pine River plant expansion project did not receive any living-out allowances. Therefore, as requested by BCYT, Westcoast undertook to ensure its contractors utilize a listed telephone number or primary residence address as criteria to determine whether a worker is defined as a local hire.

Westcoast indicated that it instructs its contractors to use "all reasonable efforts to hire labour in the locale in which the project is carried out and to hire women, people with disabilities, aboriginal people and members of visible minority groups in the same proportions as there are qualified members of the base groups available in each locale". Westcoast's application contains estimates of local workers available by trade and although the variations between trades is dramatic, it is estimated that the number of local workers would average 40 percent of the total workforce. Westcoast stated that it would be impractical to enforce minimum levels of local workers by trade. Westcoast was also of the opinion that it would not be necessary to advertise upcoming construction projects on the local television bulletin board, given other efforts to hire local workers.

The BCYT recommended in its final argument that the Board require Westcoast and its contractors ensure that its reports indicate the number of workers whose principal residence was located within the region for a period of at least 90 days prior to the date of hire. The BCYT also recommended that Westcoast's contractors be required by the Board to hire all well-qualified local job applicants in preference to equally or less-qualified outside hires, and that this be made a condition to any tender documents issued by Westcoast.

The BCYT further recommended that the Board make conditions on approving Westcoast's application that any complaints addressed to the Board by qualified local candidates for construction jobs claiming that they were not given hiring preferences or equality over equally or lesser qualified outside job applicants, would be investigated by Westcoast with a report to the Board and that Westcoast make reasonable efforts to ensure that information about construction job opportunities be made readily available to local residents and provide the Board with a report on its efforts.

The BCPCC in its final argument recommended that Westcoast take a more hands-on approach to local hire, and failing that, the Board should require proof of local origin.

The U.A. Local 170 in its final argument recommended that the Board require Westcoast to apply strict guidelines on the definition of a local resident, that the Board ensure that all facts and figures in bi-monthly reports are accurate and not rely on contractors' numbers, and that the Board, Westcoast and the B.C. Minister of Labour receive copies of all resumes and applications submitted by British Columbian workers to Westcoast's contractors to ensure that justice is done.

Views of the Board

The Board is satisfied with Westcoast's policy to maximize local hiring with the constraints of ensuring a qualified workforce and a cost-effective project. The Board notes that it makes good economic sense for Westcoast's contractors to hire locally to the greatest extent possible. The Board further notes that Westcoast has undertaken to require its contractors to meet certain criteria in identifying workers as local hires.

With respect to the recommendations and potential conditions to any approval, set out by the BCYT, BCPCC, and U.A. (Local 170), the Board is of the view that such requirements and conditions would not be appropriate.

6.4 Construction Camp Working and Living Conditions

The BCPCC expressed concerns about the accessibility of the work camp to union representatives clergy, worker advocates, family members, and other members of the general public. Westcoast stated that camp access would be limited to construction and Company personnel for public safety reasons. Access to others would be allowed under special circumstances.

Westcoast stated that employees who reside locally would not be expected to require access to camp facilities. It would be decided later if employees residing locally would have access to the mess hall or other camp facilities.

The BCPCC expressed concerns about the construction camp's internal standards, conditions and Westcoast's mode of management. Westcoast maintained that the camp would be run according to provincial regulations with a camp committee consisting of workers and management. It was also noted that the camp manager would be responsible for maintenance and inspection of camp facilities with respect to living, health and safety conditions.

The BCPCC recommended that contractors be required to allow union representatives access to workers at remote sites.

Views of the Board

The Board notes that regulations and standards are in place to ensure that the camp facility would provide acceptable living conditions for workers.

The Board is of the view that the residential part of the work camp should be open to worker's families and those providing services to workers. However, with regard to

access to construction sites, the Board would support Westcoast's position that access to the construction sites must be controlled to ensure public safety.

Chapter 7

Financial Matters

7.1 Toll Treatment for the Proposed Facilities

In its application, Westcoast requested that the tolls for services to be provided through the proposed facilities be determined on a rolled-in basis. The service agreements which underpin the expansion project are conditional on the applied-for facilities being tolled on a rolled-in basis.

Under the rolled-in method, the capital cost, operating costs, and the incremental contractual demand of the proposed facilities are grouped with those of the existing facilities so that one set of tolls, that are applicable to all customers, is developed based on the approved toll design. Under the stand-alone, or incremental toll design, the capital costs, operating costs, and incremental contractual demand of proposed facilities are tolled separately from existing facilities. Stand-alone tolls would be applicable only to customers using the proposed facilities.

In support of the rolled-in toll method, Westcoast stated that, because shippers behind all plants receive the same gathering or processing services, it would not be fair to charge different tolls based on the location or vintage of the facilities. Westcoast also stated that shippers who renew capacity are just as responsible for expansions as are the expansion shippers.

Westcoast added that rolled-in tolls are consistent with the principle that users of the system pay only for the service provided and do not acquire rights to old facilities with their lower embedded cost and associated lower tolls because of past use of facilities or payment of tolls. Westcoast submitted that applying rolled-in tolls in this case would not cause rate shock, because the resulting tolls are not expected to be significantly higher than the tolls for the existing facilities and, in the case of raw gas transmission, the tolls are expected to be lower.

Westcoast also submitted that rolled-in tolls provide consistent price signals to all shippers on the system. Given that allocative efficiency requires that consumers of a product be faced, to the extent possible, with the long-run marginal cost of the product and recognizing that rolled-in tolls may not be equal to marginal cost, Westcoast contended that, under rolled-in tolls, at least, all parties making decisions to continue using the service or using it for the first time will be faced with the same price signal. On the other hand, under incremental tolling, shippers using old vintage facilities face tolls which are much lower than marginal cost while shippers using new vintage facilities face tolls which are considerably higher than marginal cost, with the result that users of old vintage facilities are encouraged to over-consume the services produced by pre-expansion facilities.

Westcoast also submitted that rolled-in tolls are consistent with other existing policies and regulations in the sense that they are more consistent with a competitive gas market than incremental or vintage tolls. Further, rolled-in tolls would not prevent or limit further expansions to the system, would encourage attachments of new gas supply and promote competition amongst gas sellers.

Finally, Westcoast submitted that rolled-in tolls are easily understood and administratively simple, whereas incremental tolls are impractical because they would result in significant administrative complexity and yield a multi-price system for the same services.

Regarding the facilities, Westcoast took the position that the proposed facilities are integrated with the existing system. It explained that the proposed RGT facilities are either loops or extensions of existing pipelines in the Fort St. John system and that the proposed Aitken Creek plant will replace the existing Aitken Creek plant while providing greater sour gas processing capacity. Similarly, the compressor station additions are either expansions or replacements of existing compressor facilities.

Further, Westcoast explained that the flow pattern in the existing Fort St. John RGT system will be changed by the project. Westcoast elaborated that, at the present time, only gas from the Laprise and Sojer areas is processed at the existing Aitken Creek plant, with all other raw gas being delivered to the McMahon plant. After the expansion, the new Aitken Creek plant and the McMahon plant will be operationally and contractually integrated in the sense that both plants could process all of the gas from the Fort St. John supply area. Westcoast submitted that the proposed Aitken Creek plant can be viewed as an expansion of the McMahon plant, where the proposed processing plant is equivalent to adding two processing trains at the McMahon plant.

COFI et al stated that it is not opposed to the construction of the facilities, but is concerned about the associated toll impact and financial risk. COFI et al views the project as a stand-alone undertaking and, accordingly, suggested that either the project proponents or Westcoast itself should assume the associated financial risk and cost burden. To achieve this end, COFI et al suggested two courses of action. Its preferred option is to have the gathering and processing functions separated from the transmission functions and excluded from the regulated rate base. Its second option is to have the processing plant and related facilities tolled on a stand-alone basis. COFI et al also suggested that, at the next opportunity, the Board should treat the other plants and related gathering systems similarly by approving plant-specific and separate gathering area tolls.

COFI et al submitted that stand-alone tolls would approximate the conditions facing a competitive plant in the same area. The cost of production in the area would match the toll in the area, which, in turn, would foster greater competition. It also claimed that stand-alone tolls should apply in this case. In the past, for special facilities that served an identifiable and separate group of shippers, the Board often looked at the separate costs of the discrete facilities providing service to that group and tried to match the costs to the tolls charged. COFI et al stated that, in its opinion, gathering and processing facilities cannot be viewed as common facilities in the same manner that transmission pipelines can.

COFI et al was also concerned that by rolling-in the cost of the applied-for facilities, the tolls charged for the area would not match the gathering and processing costs for the Fort St. John area. This mismatching would send the wrong price signals and lead to economic inefficiencies. COFI et al added that the averaging of costs tends to conceal inefficiencies that would be apparent if processing plants were tolled separately.

Regarding Westcoast's reasons for proposing rolled-in tolls, while COFI et al agreed that the expansion is caused by aggregate demands in the Fort St. John area, it disagreed that the argument is valid when comparing the McMahon area with other plants such as Fort Nelson, Sikanni and Pine River, because there is no physical integration between any of these plants. Regarding the encouragement of efficiency, COFI et al agreed with Westcoast that a reference to the same price signal makes sense in the case of transmission facilities, but not in the case of physically distinct

gathering and processing areas. COFI et al questioned the applicability of the Board's decision in Order GH-5-89¹ to the circumstances of this application because the facilities involved in that hearing were sales gas transmission facilities, not raw gas transmission and processing facilities. Finally, COFI et al stated that it believes separate area tolls will not involve significant changes to Westcoast's current cost tracking system.

The EUG took the position that it should not be required to bear the massive costs associated with the proposed facilities. It suggested that, if these facilities are to be built, they should be built by an unregulated entity. The EUG also claimed that an increase in rate base of the magnitude proposed by Westcoast would exacerbate Westcoast's inability to compete with other pipelines that can serve the EUG's markets.

The EUG elaborated that Westcoast's existing gathering and processing tolls make natural gas purchased on the Westcoast system increasingly uncompetitive relative to other sources of gas. Further, the EUG does not believe that the problem can be solved by the use of special, alternative tolling methodologies and stated that it is opposed to rolled-in tolls for gathering and processing. The EUG stated that, should the facilities be built by an unregulated entity, costs would not be automatically passed on to all existing users of the Westcoast system. Further, it suggests that the sizing and timing of construction of facilities might also be different.

The Aitken Creek Group supports rolled-in tolls. It explained that all shippers will benefit from the project because the proposed Aitken Creek plant and McMahon plants will be operated on an integrated basis for the Fort St. John catchment area. With this integration of facilities, the Aitken Creek Group feels that different tolls based on the vintage of the facilities would be inappropriate.

The Aitken Creek Group also highlighted the Board's statements from the GH-5-89 Reasons for Decision that the size of an expansion is not a factor to be considered in justifying a change in tolling methodology; that payment of tolls by existing tollpayers do not confer future benefits or acquired rights; that vintaging of facilities is not justified, particularly on an integrated system; and that the aggregate demand of all users, including renewals, gives rise to the need for the new capacity. In the view of this group, the situation of the proposed facilities parallels that considered by the Board in the GH-5-89 proceeding.

BC Gas was of the opinion that the project should not be built as part of Westcoast's regulated operations and that the Board should not authorize construction of the facilities. However, if the Board were to decide to approve the facilities, BC Gas would want them tolled on a stand-alone basis so that those parties gaining incremental benefits from the proposed facilities would become responsible for all incremental costs.

BC Gas stated that it believes the applied-for gathering and processing facilities are distinct and separate and provide an additional service, and that, as such, the associated costs should not be pooled with those of other facilities. It submitted that parties requiring the requested facilities, are identifiable and clearly the beneficiaries. It added that the proposed Aitken Creek plant is designed to serve a

¹ The application that led to the issuance of this Order had been filed by TransCanada PipeLines Limited on 29 June 1989. The Board's decision in the GH-5-89 proceeding were release in a three-part Reasons for Decision that was released in November 1990 and April 1991.

specific geographic area, that the proposed plant will be operated as a separate entity, and that the raw gas to be processed is differentiable as to H₂S content and liquids.

BC Gas also questioned whether the raw gas transmission facilities should be considered integrated as some of the loops, namely the Milligan-Peejay and the Tommy Lake Loops, would have to be built irrespective of whether all the applied-for facilities are approved.

If tolls are set on a stand-alone basis, BC Gas asserts that several toll design criteria would be satisfied. The tolls would be fair and promote equity because producers owning reserves and contracting for capacity would pay the costs of treating their gas for sale at a separate and distinct cost-related toll. Further, existing customers would not be required to cross-subsidize producers behind the new plant, and the costs and benefits would be matched rather than bearing a permanent cross-subsidy. Finally, barriers to entry caused by rolled-in tolls would be replaced with the possibility of competitive alternatives now and in the future.

BC Gas also claimed that the criteria of rate stability would be met because existing customers would pay appropriate tolls without having to cross-subsidize the proposed plant. Separate and distinct tolls for these additional plants would provide predictable rates without subsequent distortions caused by the rolling-in of the costs of future facility additions.

Stand-alone tolls would convey the proper price signals and achieve economic efficiency because, with costs and benefits matched, producers would receive the proper allocation of costs to process their specific reserves. BC Gas added that, if market forces dictate the price, revenue sufficiency and stability would be assured for appropriately timed, sized and sited processing plants. The criteria of practicality, administrative simplicity, general acceptance, and consistency with other policies and regulation would also be met.

On the other hand, BC Gas is opposed to rolled-in tolls because such methodology would result in: (a) a direct cross-subsidy by the customers of BC Gas to the benefit of those parties contracting for service on the proposed facilities; (b) consequential exclusion of other companies competing to construct gathering and processing facilities in British Columbia, since those other companies cannot shift costs to others through a rolled-in tolling methodology; (c) a "socializing" of the costs of inefficient and efficient gathering and processing operations into one pool of costs, thereby thwarting appropriate pricing signals; and (d) the bestowing of residual risks of market, supply or operating plant failures onto customers like BC Gas who are largely captive to Westcoast.

If the costs were rolled-in, BC Gas contended that users of its own facilities would face dramatic increases in gas prices. Further, in the opinion of BC Gas by Westcoast's own calculations, customers using existing facilities would permanently subsidize the proposed Aitken Creek plant by up to \$168.5 million over the next ten years.

In final argument, BC Gas indicated that the circumstances of Westcoast's application are different from those faced by parties in the TransCanada GH-5-89 proceeding. Firstly, that decision dealt with a pipeline expansion that could not have been undertaken by anyone other than TransCanada. In contrast, the processing facilities in Westcoast's application could be built by many parties other than Westcoast. Secondly, processing and gathering facilities in British Columbia can be constructed outside the Board's jurisdiction, which is not the case for TransCanada's transmission facilities. Finally, in GH-5-89, the Board was convinced that the facilities resulted from the aggregate demand of

all shippers; whereas, in the Westcoast application, only shippers behind the Fort St. John area benefit from the proposed facilities.

BC Gas also argued that the producers who are seeking to have Westcoast add processing capacity and who will benefit from the addition of that capacity should be required to pay the incremental costs to ensure that no undue cross-subsidization by users of Westcoast facilities does occur.

In the view of BC Gas, rolled-in tolls transfer the risks of a project to parties who are not proponents of a project. Further, they send incorrect price signals because increased tolls for processing at other plants, such as Fort Nelson and Sikanni, will have the effect of reducing drilling activity in the area. Conversely, tolls at the proposed Aitken Creek plant will be too low, tending to increase drilling activity in that area. Rolled-in tolls send incorrect price signals to producers and users of the Westcoast's facilities such as BC Gas by setting prices different from marginal cost.

The Province stated, in final argument, that it found the project to be within the public interest. While it conceded that, upon more careful analysis, it might prefer a toll design other than the rolled-in toll proposal, it did not object to the proposal.

Views of the Board

Regarding the extent to which the applied-for facilities would be integrated with the Westcoast system, the Board notes that the facilities essentially involve loops and extensions of existing pipelines in the Fort St. John RGT system and the replacement of a processing plant by another plant that has greater sour gas processing capacity. Moreover, after the expansion, the flow pattern in the existing Fort St. John raw gas transmission system would be changed. The McMahon and new Aitken Creek plants would be operationally integrated because both plants would process the raw gas in the Fort St. John supply area and therefore, the proposed Aitken Creek plant would essentially be an expansion of the functions of the McMahon plant.

The Board is of the view that, if approved, the proposed plant and the McMahon plant would function in tandem to further the development of the already highly developed Fort St. John supply area. The proposed Aitken Creek plant is not a discrete facility to be constructed for the purpose of opening new, previously undeveloped supply areas and for processing gas exclusively from these new fields.

The Board disagrees with BC Gas and COFI et al that the proposed facilities would be built to provide service for specific users. In the Board's opinion, shippers contract for specific services only and they do not contract for specific facilities on the Westcoast system.

While the Board sees merit in the argument that demand associated with the Fort St. John catchment area is primarily responsible for the proposed facilities, it disagrees that, for toll design purposes, the proposed Aitken Creek plant should be treated on a stand-alone basis as proposed by COFI et al. The Board is of the opinion that, because of the integration of the proposed plant with the McMahon plant, the proposal cannot be adequately addressed without examining the appropriateness of the toll design for the existing facilities. This matter may be better addressed in the context of

a proceeding to examine the regulation of Westcoast's gathering and processing facilities.

The Board agrees that it is beneficial to set tolls, as far as possible, equal to marginal cost so as to convey, as suggested by BC Gas, the proper price signals to shippers and to achieve economic efficiency through better matching of costs of new facilities with their benefits. However, based on the record of this proceeding, the Board notes that both the rolled-in and incremental toll design methodologies could yield tolls that are different from long run marginal cost. In the case of rolled-in tolls, at least parties making decisions to continue or start receiving service would face the same price signals, but with the risk that the price signals might not be the desirable ones from an economic efficiency point of view.

From the standpoint of promoting the development of a properly functioning gas market, the Board recognizes that allowing rolled-in toll treatment in this case may allow B.C. producers, who have invested significant sums in the development of gas reserves in northeastern B.C., to gain market shares in traditional markets and expand to new market areas. Accordingly, competition among producers for markets would be enhanced. On the other hand, the Board is cognizant of the position of certain parties that incremental toll treatment would more closely reflect gathering and processing costs and, therefore, be more compatible with a properly functioning market. In the Board's view, economic efficiency and consistency with properly functioning markets are not determinative factors supporting either rolled-in or incremental toll treatment in this proceeding.

Having considered all the evidence before it, the Board is persuaded that tolling the applied-for facilities on a rolled-in basis would be appropriate. In reaching this conclusion, the Board has placed significant weight on the extent to which the proposed facilities would be integral to the Westcoast facilities serving the Fort St. John catchment area.

Parties referred to TransCanada's GH-5-89 decision as putting forward principles in favour of the roll-in of the costs of new facilities. Although the Board supports the principles set forth in the GH-5-89 decision, the Board believes that the appropriateness of a tolling methodology is a matter that is project-specific and that every application should be assessed independently.

In view of the foregoing, the Board approves Westcoast's request that the tolls for the services to be provided through the applied-for facilities be determined on a rolled-in basis.

7.2 Financing

In its application, Westcoast stated that it intends to finance the \$397.6 million cost of the Fort St. John Expansion project initially through internally generated funds and the drawdown of short term credit facilities. It was Westcoast's intention to secure more permanent financing through issuance of long term debt and equity, the timing of which would depend on market conditions and cash requirements.

At the hearing, no intervenor specifically questioned Westcoast's ability to raise the required funds.

Views of the Board

The Board is of the view that the Company has the ability to finance the applied-for facilities.

7.3 Other Toll Matters

7.3.1 Liquids Products Stabilization and Fractionation Service

Westcoast has proposed a single toll for LPSF service available at the McMahon plant and the proposed Aitken Creek plant. Petro-Canada disagreed with Westcoast's approach of tolling the two services together. It submitted that the proposed LPSF services at the proposed Aitken Creek plant are different from those offered at the McMahon plant, thus there should be a stand-alone LPSF toll for the proposed Aitken Creek plant.

Petro-Canada pointed out that, at the proposed Aitken Creek plant, a combined propane and butane product will be produced and re-injected into the sweet gas stream; in contrast, at the McMahon plant, the natural gas liquids will be fractionated to produce separate streams of commercial grade propane and butane. Petro-Canada also pointed out that there is an element of cost recovery at the McMahon plant from the commercial grade of propane and butane which does not apply at the proposed Aitken Creek plant as the combined propane and butane is not marketed. Finally, Petro-Canada argued that, at the McMahon plant, the predominant purpose of the LPSF service is to produce commercial grade propane and butane, whereas the primary purpose of the liquid products stabilization and fractionation at the proposed Aitken Creek plant is to provide treatment for the raw gas stream to remove mercaptans and condensate from the gas in order to meet the specifications for sales gas.

Petro-Canada also expressed concern with Westcoast's proposed cost allocation and toll design for the LPSF services because the methodology did not take into account the on-going contractual obligations that Petro-Canada has with Amoco Canada Petroleum Company Ltd. ("Amoco") to provide LPSF service. The contract pre-dates Westcoast's purchase of the LPSF facilities at the McMahon Plant and, by Petro-Canada's calculations, the proposed LPSF toll would have the effect of burdening Petro-Canada with a shortfall of approximately \$29.6 million over the remaining life of the contract.

Following further discussions between Westcoast, Amoco and CanWest during the hearing, Petro-Canada submitted an alternative toll design for consideration of the Board. Petro-Canada proposed that both the LPSF and liquids recovery toll schedules be eliminated and replaced by a single "liquids handling" toll schedule that would apply at both plants. Neither Amoco nor CanWest supported the proposal.

In rebuttal, Westcoast stated that it is willing to discuss the points put forward by Petro-Canada with all shippers outside the current hearing process.

7.3.2 Heat Content

CanWest raised questions related to the difference in the heat content of the gas processed at the proposed Aitken Creek plant as compared to that processed at the McMahon plant. Westcoast explained that the heat content of the residue gas stream from the proposed Aitken Creek plant would

be lower than that of the McMahon plant because the plant process is designed to remove more condensates than are removed at the McMahon plant. However, Westcoast indicated that the lower heat content of the residue gas from the proposed Aitken Creek plant would be compensated for by larger quantities of condensate liquids. CanWest was concerned that larger quantities of condensate liquids would not benefit its sales gas customers since the customers purchase sales gas based on its energy value. In addition, it raised the question of how the condensate and associated costs would be allocated between shippers given that their gas could be processed at either plant. Westcoast stated that it plans further discussions with shippers on these issues.

Views of the Board

The Board notes that Westcoast is willing to discuss the LPSF tolling and the heat content issues with shippers and that any resolutions of these issues would be submitted to the Board for approval. The Board is of the view that if the heat content issue cannot be resolved through discussions among concerned parties, it could be dealt with in a future proceedings. The Board notes that it has already considered the LPSF tolling issue in the RH-1-92 and RH-3-92 toll proceedings, and expects that this issue would be reconsidered in future tolls proceedings only if the new Aitken Creek plant should give rise to additional considerations.

Chapter 8

Economic Feasibility

8.1 Economic Feasibility

The Board determined the economic feasibility of the Fort St. John expansion based on the likelihood that the facilities would be used at a reasonable level over their economic life and on the likelihood that the associated demand charges would be paid. In particular, the Board considered: the long term availability of gas supply in the Fort St. John area; the long-term gas demand outlook for markets served by Westcoast; the length of the contractual commitments made by gas producers supporting the application; and the likely toll impact that would result from the proposed facilities.

Westcoast indicated that reserves additions of $82 \times 10^9 \text{m}^3$ (2.9 Tcf) are projected to be found in the Fort St. John area during the period 1993 to 2004. Another $141 \times 10^9 \text{m}^3$ (5.0 Tcf) of reserves additions remain to be discovered after 2004. The projected reserve additions exceed the requirements of the proposed expansion, and support the need for the Fort St. John facilities.

According to Westcoast's forecast, growing market demand requires the construction of the proposed facilities. Although a deliverability surplus currently exists, if the Fort St. John expansion is not built a large deliverability deficit would eventually result due to excess market demand. While there would be a surplus shortly after the new facilities are constructed, Westcoast has projected this surplus to decline to 793 103m³/d (28 MMcfd) by 2001/02.

To support its application, Westcoast entered into executed firm service agreements for Zones 1 and 2 for terms of 5 and 10 years respectively. Additional details regarding contractual arrangements can be found in Chapter 3 of the Reasons for Decision.

The analysis conducted by Westcoast to determine the toll impact of the new facilities indicated that the tolls are expected to fall, on average, by 3.1 percent over the period of 1995 to 2004 in Zone 1. In Zone 2 over the same period, treatment service tolls are expected to rise by 3.3 percent, liquids recovery tolls are forecast to rise by 19.3 percent, and LPSF tolls are anticipated to rise by 46.9 percent.

Upon cross-examination by BC Gas, Westcoast acknowledged that no project specific economic analysis had been conducted to determine the net present value of the proposed Fort St. John expansion. It indicated that the project was justified on the basis of an analysis of the gas markets, the gas supply, and its assessment that the new facilities will be contracted over its useful life. However, Westcoast did indicate that it conducted an economic analysis of the new plant design.

Views of the Board

The Board is satisfied that the proposed facilities are economically feasible given that there is a strong likelihood that the facilities would be used at a reasonable level over their economic life and that the demand charges would be paid. The evidence

indicates that there are adequate gas supplies, that shippers are willing to contract for a substantial time period, and that the resulting impacts on tolls are tolerable.

Although Westcoast is anticipating a considerable deliverability surplus after the new facilities are completed, construction of the new facility does not worsen the existing deliverability situation and the surplus is completely eliminated, according to Westcoast's forecast, by the year 2003/2004. The Board's views with respect to the adequacy of the firm service agreements is addressed in Chapter 3.1.

With regard to toll impacts, the renewal of contracts for gathering and processing services should not be severely affected by the increases in tolls for liquid recovery and LPSF services as these services account for only a small portion of total Zone 2 tolls (e.g. 16.1 percent of the Zone 2 tolls in 1997).

With respect to the lack of a project specific economic analysis, the Board is of the view that the issues noted above are the appropriate items to be considered in determining economic feasibility.

8.2 Impact of Tolls on Consumers and Producers

During the hearing much concern was expressed with respect to toll increases expected from the proposed facilities and the effect these increases would have on the competitiveness of gas shipped on Westcoast's system. Competitiveness, in turn, is to some extent dependent on who incurs the cost of the toll increase. Several views were expressed with respect to the incidence of toll increases on producers and consumers.

Westcoast expressed the view that parties moving gas on its system cannot necessarily pass through increased toll costs to the market as the market price will be set through the dynamics of supply and demand. Also, producers will receive a wellhead price based on the market price, net of transportation and treatment costs. Dr. Mansell, on behalf of Westcoast, indicated that, over the longer term, prices are set in the North American market and the tolls on the Westcoast system essentially determine what the netback to the producer will be.

BC Gas indicated that it pays Westcoast's system tolls through its contracts and the cost of Westcoast tolls are passed on to its customers. The EUG stated that if Westcoast's demand charges continue to increase, producers will be forced either to shift the burden back to purchasers or, alternatively, abandon drilling activity in B.C. in favour of better returns elsewhere. The EUG believed it was only possible to shift the demand charges associated with Westcoast gathering and processing facilities to producers for the short run, but in the longer run these costs would have to be passed on to customers.

COFI et al stated that the toll increases, given competitive supply market conditions, will be absorbed by producers in the short term. However, rising costs will establish a new higher floor price below which producers will lose money. Rolled-in tolls will have the effect of ensuring that all producers have the same cost burden and price constraints. This introduces a distortion in the market that will put upward pressure on the price in the long-term.

Views of the Board

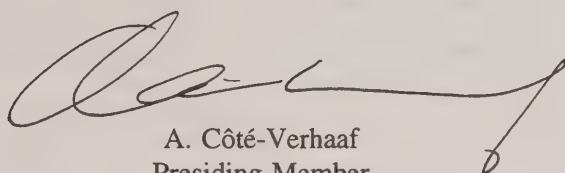
In the Board's view, the price of gas for B.C. and the U.S. pacific northwest states would be determined in the marketplace. The ability of producers to pass on increases in processing and transportation costs will be dependent upon the alternative options available to both buyers and producers. In the case where buyers have many alternative purchase options, it would be difficult for producers to pass on increased costs. Conversely, where a captive market exists, producers may be able to pass on most of the cost increase, particularly in the short run. In the longer run, consumers may choose other options such as conserving on their natural gas use, switching to other fuels or seeking other supply sources, thereby somewhat reducing the ability of producers to pass on cost increases. On balance, it is reasonable to conclude that over time, each group would bear some of the costs.

Chapter 9

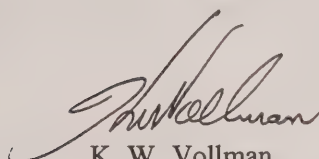
Disposition

On the basis of all the foregoing, the Board finds that the applied-for Fort St. John System Expansion is in the public interest. Therefore, the Board would, pursuant to section 52 of the Act, recommend to the Governor in Council that a certificate be issued in respect with the 457 mm Milligan-Peejay Loop and the 406.4 mm Umbach Loop. The certificate would be subject to the conditions outlined in Appendix II. Also, the Board would issue, pursuant to section 58 of the Act, Order XG-W5-7-96 (Appendix III) exempting Westcoast from the provisions of sections 30, 31 and 47 of the Act in respect of the facilities listed in Schedule A of the Order.

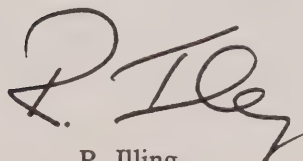
With regard to the determination concerning toll methodology, the Board finds, pursuant to section 59 of the Act, that a rolled-in design would be appropriate for these expansion facilities.



A. Côté-Verhaaf
Presiding Member



K. W. Vollman
Member



R. Illing
Member

February 1996
Calgary, Alberta

Appendix I

Land Requirements and Status

Table A1-1

FACILITY	LAND REQUIREMENT	LANDOWNER STATUS	STATUS OF ACQUISITION
New Aitken Creek Plant Site	<ul style="list-style-type: none"> 75 acres of new land will be acquired in fee simple 	<ul style="list-style-type: none"> all Crown land 	<ul style="list-style-type: none"> application made but no permit received to date.
Beg/Jedney Booster Station Replacement	<ul style="list-style-type: none"> to be integrated within the proposed Aitken Creek plant site 	<ul style="list-style-type: none"> all Crown land 	<ul style="list-style-type: none"> application made but no permit received to date
Nig Booster Station Addition	<ul style="list-style-type: none"> to be located within fee simple land owned by Westcoast 	<ul style="list-style-type: none"> fee simple land of Westcoast 	<ul style="list-style-type: none"> not required
Milligan Peejay Loop (457 mm O.D., 42.3 km)	<ul style="list-style-type: none"> to be installed mostly within the existing 18 m wide right-of-way an additional 12 m right-of-way or temporary work space adjacent to the existing right-of-way additional right-of-way not required for the majority of private lands an additional 18 m wide right-of-way may be acquired for diversions/deviations 	<ul style="list-style-type: none"> 55 private parcels; 2 Crown 	<ul style="list-style-type: none"> no acquisitions or applications have been made on either private or Crown land
Milligan Peejay Loop (324 mm O.D., 9.2 km)	<ul style="list-style-type: none"> to be installed mostly within the existing 18 m wide right-of-way an additional 12 m of new right-of-way or temporary work space, in most cases, adjacent to the existing right-of-way 	<ul style="list-style-type: none"> 11 private parcels; 2 Crown parcels 	<ul style="list-style-type: none"> application for Crown land right-of-way made but no permit received to date. No private acquisitions to date.

FACILITY	LAND REQUIREMENT	LANDOWNER STATUS	STATUS OF ACQUISITION
Umbach Loop (406.4 mm O.D., 19.6 km), Umbach Extension (406 mm O.D., 25.3 km), and condensate loop (406 mm O.D., 7.5 km)	<u>Umbach and Condensate Loops</u> <ul style="list-style-type: none"> to be installed within the existing 18 m wide right-of-way an additional 12 m right-of-way adjacent to the existing right-of-way 	<ul style="list-style-type: none"> 2 private parcels; remainder Crown 	<ul style="list-style-type: none"> application for Crown land right-of-way made but no permit received to date. No private acquisition to date
	<u>Umbach Extension Loop</u> <ul style="list-style-type: none"> to be installed within the existing 18 m wide right-of-way an additional 12 m right-of-way adjacent to the existing right-of-way 		
West Aitken Creek Extension (324 mm O.D., 10.3 km)	<ul style="list-style-type: none"> to be installed except for minor diversions within the existing 18 m wide right-of-way an additional 18 m wide right-of-way adjacent to the existing right-of-way 	<ul style="list-style-type: none"> all Crown land 	<ul style="list-style-type: none"> no application made to date
Aitken Creek Sales Gas Loop (610 mm O.D., 22.2 km)	<ul style="list-style-type: none"> to be installed, except for minor diversions, within the existing 18 m wide right-of-way an additional 18 m wide right-of-way adjacent to the existing right-of-way 	<ul style="list-style-type: none"> all Crown land 	<ul style="list-style-type: none"> no application made to date
Tommy Lakes Loop (406 mm O.D., 33.3 km)	<ul style="list-style-type: none"> to be installed, except for minor diversions, within the existing 18 m wide right-of-way an additional 12 m of new right-of-way adjacent to the existing right-of-way a new 18 m permanent right-of-way maybe required for diversions away from the existing right-of-way 	<ul style="list-style-type: none"> all Crown land 	<ul style="list-style-type: none"> no application made to date

Terms and Conditions

General

Unless the Board otherwise directs, the following conditions shall apply:

1. (a) Westcoast shall cause the additional facilities to be designed, manufactured, located, constructed and installed in accordance with those specifications, drawings, and other information or data set forth in its application, or as otherwise adduced in evidence before the Board, except as varied in accordance with paragraph 1(b) hereof.

(b) Westcoast shall cause no variation to be made to the specifications, drawings or other information or data referred to in paragraph 1(a) without the prior approval of the Board.
2. Westcoast shall implement or cause to be implemented all the policies, practices, recommendations, procedures and commitments for the protection of the environment included in or referred to in its application, its responses to the Board's Information Requests, its information response to DFO of 22 December 1994, its Stream Crossing report of January 1995, the 30 January 1995 WEI-DFO clarification of items raised in the DFO letter dated 25 January 1995 and WEI's further commitment of 1 February 1995 to DFO and filed with the Board, the relevant section of its Environmental Protection Manual - Pipeline Construction (September 1992), or as otherwise adduced from the evidence before the Board in the GH-5-94 proceeding.
3. This Order and Certificate shall expire on 31 December 1997 unless the construction and installation of applied-for facilities has commenced by that date.

Prior to Commencement of Construction

4. Westcoast shall, prior to the commencement of construction, file with the Board copies of any provincial permits or authorizations which contain environmental conditions for the applied-for facilities as well as maintain an information file(s) in the construction office(s) which would include any changes made in the field, or permits obtained following the commencement of construction.
5. Westcoast shall, at least 15 days prior to the commencement of construction of each of the proposed pipelines and plant expansion facilities, file with the Board an update of its Environmental Issues List, as it pertains to that pipeline or facility prepared in accordance with paragraph 28(1)(a) of the Board's *Onshore Pipeline Regulations* ("Regulation"). If additional issues arise during construction, Westcoast shall file an updated Environmental Issues List in accordance with subsection 28(2) of the Board's Regulations.

6. Westcoast shall, at least 15 days prior to the commencement of construction of the applied-for facilities, file with the Board a detailed construction schedule identifying the major construction activities.
7. Westcoast shall file with the Board at least 15 days prior to the commencement of construction a copy of the Soil Conservation and Impact Mitigation Plan detailing soils handling, reclamation and protection measures to be implemented.
8. Westcoast shall, prior to the commencement of construction of each of the proposed pipeline sections, file with the Board evidence that all land rights have been obtained for that proposed pipeline section.
9. Westcoast shall, prior to the commencement of construction of the new Aitken Creek plant, file all the executed firm service agreements for treatment service to ensure full utilization of the expanded plant capacity for the Fort St. John Expansion project.
10. Westcoast shall, 30 days prior to the commencement of construction of the new Aitken Creek plant, file its revised gas plant construction safety program manual.
11. Westcoast shall, prior to the commencement of construction, file its control cost estimate for the applied-for facilities indicating also the levels of accuracy of the estimates.
12. Westcoast shall, prior to construction of the new Aitken Creek plant, file the criteria to be used in siting the air quality monitoring station.
13. Westcoast shall, prior to the commencement of construction of the new Aitken Creek Plant, file the final design specifications for the spray irrigation system, including details of the site location, operating procedures and the monitoring program.
14. Westcoast shall, prior to the commencement of construction of the affected pipelines, file the results of the further archaeological and heritage resource site assessments to be conducted at the high potential locations.
15. Westcoast shall, 30 days prior to commencement of construction of the Milligan-Peejay and Umbach Loops, submit details of the crossing techniques, slope stability design and mitigative measures that will be used for the river crossings.

During Construction

16. Westcoast shall, 30 days prior to the start of pressure testing the new plant and compressor station piping systems, submit its pressure testing methods and procedures.
17. Westcoast shall, during construction, file updated construction schedules, if any significant change to the schedules provided pursuant to condition 6 occur.
18. During construction, Westcoast shall file with the Board as well as any interested party who so requests in writing, in a format to be determined in consultation with Board staff, bimonthly construction progress and cost reports providing the completion percentage of each construction activity, a breakdown of costs incurred during the preceding two months, and an

update of projected costs to complete the project including an explanation of any significant variances.

19. During construction, Westcoast shall monitor local hiring performance in light of current local and/or regional labour market conditions.

Prior to Commencement of Operation

20. Westcoast shall, prior to the commencement of operation, file with the Board copies of any provincial permits or authorizations that have to be obtained prior to the commencement of operation of the expansion facilities.
21. To enable the Board to perform an on-site audit of Westcoast's pressure testing records for the new facilities, Westcoast shall, 30 days prior to start-up, notify the Board in writing of its proposed plant, and Beg/Jedney and Nig booster stations start-up dates.

Post-Construction

22. Westcoast shall file with the Board post-construction environmental reports in accordance with section 58 of the Board's Regulations.
23. Further to the commitments and undertakings made during the GH-5-94 proceeding, Westcoast shall file with the Board an assessment of all studies and monitoring related to air emissions following the start-up of the applied-for plant and, for Board approval, any proposed mitigative measures.
24. Westcoast shall, within 8 months of commencement of the operation of the gas plant and upgraded stations, file with the Board monitoring reports for said facilities which detail the results of an appropriate monitoring program. This report should include but not be limited to:
 - (a) the noise emission levels at the source, fence line, and the three closest residences, if any within a three kilometre radius, at the maximum operating level; and
 - (b) any comments or complaints received as a result of operations, how these have been addressed and whether the complainant is now satisfied.

Appendix III

Order XG-W5-7-96

IN THE MATTER OF the *National Energy Board Act* ("the Act") and the regulations made thereunder; and

IN THE MATTER OF an Application by Westcoast Energy Inc. ("Westcoast") pursuant to Part III and IV of the Act for *inter alia*, certain exemptions pursuant to section 58 of the Act in respect of certain facilities filed with the Board under File 3200-W005-7.

B E F O R E the Board on 23 February 1996.

WHEREAS an application from Westcoast dated 6 October 1994, as subsequently amended, was received by the Board to construct and operate expansion facilities on Westcoast's Fort St. John raw gas transmission system.

AND WHEREAS the Board issued Hearing Order GH-5-94 dated 31 October 1994 setting the application down for public hearing;

AND WHEREAS, pursuant to Hearing Order GH-5-94, the Board conducted a public hearing in Fort St. John, British Columbia on 5 to 13 February 1995 and in Vancouver, British Columbia on 20 February to 10 March 1995 to consider the application;

AND WHEREAS pursuant to the *Environmental Assessment and Review Process Guidelines Order* ("the EARP Guidelines Order"), the Board has performed an environmental screening and has considered the information submitted by Westcoast and evidence adduced at the hearing;

AND WHEREAS the Board has determined, pursuant to paragraph 12(c) of the EARP Guidelines Order, that the potentially adverse environmental effects, including the social effects directly related to those environmental effects, which may be caused by the proposed expansion facilities are insignificant or mitigable with known technology and public concern about the proposal does not warrant referral for a panel review;

AND WHEREAS the Board has examined the application and considers it to be in the public interest to grant the relief requested therein;

IT IS ORDERED THAT the proposed Fort St. John Expansion Project facilities, as more particularly described in Schedule A to this Order, are exempt from the provisions of sections 30, 31, and 47 of the Act, upon the following conditions:

Schedule A

Westcoast Energy Inc. Fort St. John Expansion Project Description and Estimated Cost of Applied-for Facilities

	<u>Cost Estimate</u> (\$000)
New Aitken Creek Gas Plant Expansion	265 500
<p>The plant involves facilities required to process raw gas processing capacity of 9 050 10³m³/d (320 MMcfd) and recover 8 200 10³m³/d (290 mmcfd) of sales gas, 160 tonnes per day of sulphur at an efficiency of 98.4 percent and 715m³/d (4500 bbl/d) of condensate. The expansion facilities include:</p>	
(1) <i>Inlet Separation and Condensate Stabilization</i> Two parallel trains	
(2) <i>Gas Sweetening</i> Two parallel amine sweetening trains.	
(3) <i>Dehydration</i> Two parallel IFPECOL Dehydration trains with a common regeneration system for controlling the water content of the sweetened gas.	
(4) <i>Dewpoint control and Refrigeration, and Recompression</i> Dual train turbo expander and single refrigeration train for extraction of natural gas liquids ("NGLs") from the sweetened gas, and two parallel compression trains driven by the turbo-expander to re-compress sweetened gas.	
(5) <i>Liquids Fractionation and Treatment</i> A single train fractionation and treatment unit consisting of a deethanizer, debutanizer and associated heat exchangers, pumps and auxiliary equipment.	

(6) *Sulphur Recovery*

Two parallel MCRC trains, each consisting of a reaction furnace, heat recovery boiler, four converters, reheat and sulphur condenser heat exchangers, air blowers, instrumentation, and controls. Also included is a sulphur de-gassing system for reducing the residual H₂S level in the liquid sulphur product and common sulphur rundown pit and storage tank.

A Claus converter, and incinerator and stack treats and emits remaining acid gas to the atmosphere.

(7) *Utility and Auxiliary Facilities*

Major facility consists of two fuel gas driven power generator units, a fired heating medium boiler, tanks, and pumps. A control system, control room, shop, warehouse, and office facilities are also included.

(8) *Additional Site Facilities*

An emergency sulphur storage facility provides storage for 30 days of sulphur production.

Booster Station Expansion

38 100

(1) *Beg/Jedney Booster Station*

New compressor station, located at the new Aitken Creek plant, with two new 5 190 kw (6 960 hp) gas driven turbine compressor units.

31 400

(2) *Nig Booster Station*

Addition of a 1 900 kw (2 550 hp) reciprocating compressor unit.

19 600

Pipeline System Expansion

81 100

(1) *Milligan Peejay Loop*

A 323.9 mm (12 inch) diameter, 9.2 km loop of the Milligan-Peejay raw gas pipeline.

3 400

	<u>Cost Estimate</u> (\$000)
(3) <i>Aitken Creek Extension Pipeline</i> A 323.9 mm diameter, 10.3 km extension to the existing Aitken Creek pipeline.	3 800
(4) <i>Aitken Creek Sales Gas Pipeline</i> A 610 mm (24 inch) diameter, 22.2 km loop of the existing Aitken Creek sales gas pipeline.	13 800
(5) <i>Tommy Lakes Loop</i> A 406.4 mm diameter, 33.3 km loop of the existing Tommy Lakes raw gas pipeline.	14 300
(6) <i>Alaska Highway Pipeline Modifications</i> Install control valves, flow measurement, slug catcher and pigging facilities.	2 800
Estimated Total Cost	\$354 600

